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DIONY'SIUS THE YOUNGER, son of Dionysius the Elder, succeeded him as tyrant of Syracuse, being acknowledged as such by the people. His father had left the state in a prosperous condition; but young Dionysius had neither his abilities nor his prudence and experience. He followed at first the advice of Dion, who, although a republican in principle, had remained faithful to his father, and who now endeavoured to direct the inexperienced son for the good of his country. For this purpose Dion invited his friend Plato to Syracuse about 364 B.C. Dionysius received the philosopher with great respect, and in deference to his advice reformed for awhile his loose habits and the manners of his court. But a faction, led by Philistus, who had always been a supporter of the tyranny of the elder Dionysius, succeeded in prejudicing his son against both Dion and Plato. Dion was exiled under pretence that he had written privately to the senate of Carthage for the purpose of concluding a peace. Plato urgently demanded of Dionysius the recall of Dion, and not being able to obtain it, he left Syracuse, after which Dionysius gave himself up to debauchery without restraint. Aristippus, who was then at his court, was the kind of philosopher best suited to the taste of Dionysius. Dion meantime was travelling through Greece, where his character gained him numerous friends. Dionysius, moved by jealousy, confiscated his property, and obliged his wife to marry another. Upon this Dion collected a small force at Zacynthus, with which he sailed for Sicily, and entered Syracuse without resistance. Dionysius retired to the citadel in the Ortygia, and after some resistance, in which old Philistus, his best supporter, was taken prisoner and put to death, he quitted Syracuse by sea, and retired to Locri, the country of his mother, where he had connexions and friends. His partisans, however, retained possession of Ortygia, and a faction having risen in the town, headed by Heraclides, a demagogue, who proposed an equal distribution of property, which Dion resisted, the latter was deprived of his command, and would have been killed by the excited populace, had not his soldiers escorted him safely to Leontini. In the midst of the confusion, a successful sortie made by the soldiers of Dionysius, who plundered and burnt part of the city, recalled the Syracusans to their senses, and messengers were dispatched after Dion, requesting him to return. Dion obeyed the call, repulsed the enemy, and soon after took the citadel. But the faction of Heraclides conspired against Dion, and had him treacherously murdered, 354 B.C.

Several tyrants succeeded each other in Syracuse, until Dionysius himself came and retook it about 346. Dionysius, however, instead of improving by his ten years' exile, had grown worse; having usurped the supreme power in Locri, he had committed many atrocities, had put to death several citizens, and abused their wives and daughters. (Justinus, Ælianus.) Upon his return to Syracuse, his cruelty and profligacy drove away a great number of people, who emigrated to various parts of Italy and Greece, whilst others joined Hicetas, tyrant of Leontini, and a former friend of Dion. The latter sent messengers to Corinth to request assistance against Dionysius. The Corinthians appointed as leader of the expedition Timoleon, who had already figured in the affairs of his own country as a determined opponent of tyranny. Timoleon landed in Sicily 344 B.C., notwithstanding the opposition of the Carthaginians and of Hicetas, who acted a perfidious part on this occasion; he entered Syracuse, and soon after obliged Dionysius to surrender. Dionysius was sent to Corinth, where he spent the remainder of his life in the company of actors and low women; some say that at one time he kept a school. Justin (xxi. 5) says that he purposely affected low habits in order to disarm revenge, and that being despised, he might no longer be feared or hated for his former tyranny. Several repartees are related of him in answer to those who taunted him upon his altered fortunes which are not destitute of wit or wisdom. (Plutarch, *Dion.*; Diodorus, xvi.)

DIONY'SIUS, the son of Alexander, an historian and critic, born at Halicarnassus in the first century B.C. We know nothing of his history beyond what he has told us of himself. He states (*Antiq.*, p. 23-24) that he came to Italy at the termination of the civil war between Augustus and Antony (B.C. 29), and that he spent the following two-and-twenty years at Rome in learning the Latin language and in collecting materials for his history. (Phot. *Bibl.*, cod. lxxxiii.) He also says (*Antiq.*, p. 1725) that he lived in the time of the great civil war. The principal work of Dionysius is his *Roman Antiquities*, which commenced with the early history of the people of Italy, and terminated with the beginning of the first Punic war, B.C. 265. (*Antiq.* i. p. 22.) It originally consisted of twenty books, of which the first ten remain entire. The eleventh breaks off in the year 312 B.C., but several fragments of the latter half of the history are preserved in the collection of Constantine Porphyrogennetus, and to these a valuable addition was made in 1816 by Mai, from an old MS. Besides, the first three books of Appian were founded entirely upon Dionysius; and Plutarch's biography of Camillus must also be considered as a compilation mostly taken from the Roman Antiquities, so that perhaps upon the whole we have not lost much of this work. With regard to the trustworthiness and general value of Dionysius's history, considerable doubts may be justly entertained; for though he has evidently written with much greater care than Livy, and has studied Cato and the old annalists more diligently than his Roman contemporary, yet he wrote with an object which at once invalidates his claim to be considered a veracious and impartial historian. Dionysius wrote for the Greeks; and his object was to relieve them from the mortification which they felt at being conquered by a race of barbarians, as they considered the Romans to be; and this he endeavoured to effect by twisting and forging testimonies and botching up the old legends, so as to make out a *primâ facie* proof of the Greek origin of the city of Rome, and he inserts arbitrarily a great number of set speeches, evidently composed for the same purpose. He indulges in a minuteness of detail which, though it might be some proof of veracity in a contemporary history, is a palpable indication of want of faith in the case of an antient history so obscure and uncertain as that of Rome. With all his study and research, Dionysius was so imperfectly acquainted with the Roman constitution that he often misrepresents the plainest statements about it. (Niebuhr, *Hist. Rome*, vol. ii. p. 13, Engl. tr.) For instance, he imagines that the patricians had all the influence in the centuries, and that the plebeians and equites had nothing to do with the first class. (*Antiq.* vii. 82-87, x. 17. See Niebuhr, *Hist. Rome*, ii. p. 178, Engl. tr.) He thought the original constitution of Rome was a monarchical democracy, and calls the curies the *demus* (δῆμος.) He believed when he wrote his second book that the decrees of the people were enacted by the curies and confirmed by the senate (*Antiq.* ii. 14), and not, as he afterwards discovered, the converse. (*Antiq.* vii. 38.) In a word, though the critical historian may be able to extract much that is of great importance for the early history of Rome from the garbled narrative and the dull trifling of Dionysius, he cannot be regarded as a meritorious writer, or recommended to the student of antient history as a faithful guide. Dionysius also wrote a treatise on rhetoric; criticisms on the style of Thucydides, Lysias, Isocrates, Isæus, Dinarchus, Plato, and Demosthenes; a treatise on the arrangement of words, and some other short essays. His critical works are much more valuable than his history, and are indeed written with considerable power. The criticism on Dinarchus [DINARCHUS] displays good sense and judgment, and shows the great pains which the author took to separate the genuine writings of the Attic orators from the fabrications which passed under their name. The best editions of Dionysius are those of Hudson, *Oxon.*, 1704, 2 vols., in folio; and by Reiske, *Lips.*, 1774-1777, 6 vols., in 8vo. Mai's fragments were first published at Milan in 1816, and reprinted the following year at Frankfort. They also appear in the second volume of Mai's *Nova Collectio*, Rome, 1827. His rhetoric has been published separately by Schott, *Lips.*, 1804, 8vo.; and his remarks on Thucydides by Krüger, *Hal. Sax.*, 1823, 8vo. There is a German translation of the *Roman Antiquities* by J. Lr. Benzler, Lemgo, 1771-1772, 2 vols., 8vo. The only English translation of the *Antiquities* is the following: 'The Antiquities of Dionysius Halicarnassensis, translated into English, with notes and dissertations, by Edward Spelman, Esq.,' 2 vols., 4to., London, 1748.

DIONYSIUS of Byzantium lived before the year A.D. 196. His voyage ('Ανάπλους) in the Thracian Bosporus was extant in the 16th century, for Gyllius, who died in 1555, has given extracts in Latin from it in his work on the Thracian Bosporus. A single fragment from this work is printed in Ducange's 'Constantinopolis Christiana,' and in Hudson's Minor Greek Geographers. Perhaps there is some confusion between this Dionysius and the author of the 'Periegesis,' whom Suidas (Διονύσιος) calls a Corinthian.

DIONY'SIUS PERIEGE'TES, the author of a Greek poem in 1186 hexameter verses, intitled Τῆς Οἰκουμένης Περιήγησις, or 'a description of the habitable world.' It is not known where Dionysius was born nor where he lived. Perhaps the most probable opinion is, that he was a native of Byzantium and belonged to the latter part of the third or the beginning of the fourth century A. D. As a poem the Periegesis is of little value, and as a geographical work, not worth the trouble of reading. The commentary of Eustathius on the Periegesis possesses some value for the miscellaneous information which is scattered through it. There are two Latin translations of this poem, one by Rufus Festus Avienus, and the other by Priscianus. There are numerous editions of Dionysius. The last and best edition of the Periegesis is by G. Bernhardy, Leipzig, 1828, 8vo., in the first volume of his 'Geographi Græci Minores.'

DIOPHANTUS, a native of Alexandria, the exact date of whose birth is unknown, some authors asserting that he lived in the reign of Augustus, whilst others place him under Nero, or even the Antonines. The fact is that we do not know when he lived. He lived however, as is well ascertained, to eighty-four years of age.

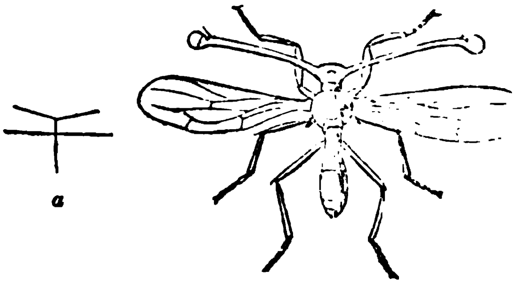
Diophantus left behind him thirteen books of Arithmetical Questions, of which however only six are extant; but from their distinct and peculiar character, in comparison with all the other writings of the Greek mathematicians, these books have given rise to much discussion. It is however scarcely to be conceived that whilst the cumbrous machinery of common language constituted the sole instrument of investigation, the very curious conclusions which we find in this work could have resulted from the researches of one single mind. To suppose that Diophantus was the inventor of the analysis which bears his name, is so contrary to all analogy with experience and the history of mental phenomena, as to be utterly impossible to admit. Still, if we inquire into the history of this branch of analysis, and ask who were the predecessors of Diophantus, or whether they were Greeks or Hindus, no satisfactory answer can be given.

Diophantus also wrote a book on Polygon Numbers (περὶ πολυγώνων ἀριθμῶν). Holzmann published at Basle, in 1575, folio, a Latin translation of both the works of Diophantus. The first Greek edition was by Meziriac, Paris, 1621, folio: an improved edition of Meziriac's edition was published by S. de Fermat, Toulouse, 1670, folio. A valuable translation of the Arithmetical Questions into German was published by Otto Schulz, Berlin, 1822, 8vo.; to which is added Poselger's translation of the work on Polygon Numbers.

DIOPSIDE, a variety of PYROXENE.

DIO'PSIS, a genus of Dipterous Insects of the family Sepsidæ. The insects of this genus are remarkable for the immense prolongation of the sides of the head. The head itself is small, and appears as if it were furnished with two long horns, each having a knob at its apex; these horn-like processes however are not analogous to the parts usually termed antennæ, but are in fact prolongations of the sides of the head, the knob at the apex of each being the eye of the insect. They vary in length according to the species. In some they are almost equal to the whole length of the insect, whereas in others they are only about half that length. The antennæ are situated close to the eyes, and are three-jointed: the basal joint is the smallest and is very short; the terminal joint is the largest, of a globular form (or nearly so), and furnished towards the apex with a simple seta; there is also a short seta on the peduncle or eye-stalk, situated about midway between the base and the apex of that process, and on the anterior part. The thorax is somewhat attenuated anteriorly, but approaches to a spherical form, and is generally furnished with two spines on each side; the scutellum is also furnished with two spines. The body is more or less elongated, sometimes nearly cylindrical, but generally increases in diameter towards the apex. The legs are tolerably long—the anterior femora are generally thick, and furnished beneath with minute denticulations, and the four posterior femora are often furnished with a spine at their apex.

For a detailed account of these curious insects we refer our readers to Mr. Westwood's excellent paper in the seventeenth volume of the 'Transactions of the Linnæan Society' in which twenty species are described.



Diopsis Sykesii, G. R. Gray.
a denotes the natural size.

The illustration is copied from one of that gentleman's figures, and represents the Diopsis Sykesii, one of the largest species of the genus, and which has been selected as possessing the longest *eye-stalks;* these processes in this insect are of a pitchy red colour, and the body is of the same tint. The head and thorax are black and the wings are clouded with brown.

But little is known of the habits of these insects. Lieut.-Colonel W. H. Sykes, who collected great numbers of the above species during his residence in India, furnished Mr Westwood with the following notice respecting their habitat and habits:—

'*Habitat.* The hill fort of Hurreechundergbur, in the western ghauts of the Deccan, at an elevation of 7000 feet above the level of the sea, 10° 23′ N. lat., 77° 30′ E. long.

'This insect affects chasms or ravines in the lofty woods which conceals the mountains in India. In various places where the sunbeams occasionally pierce the woods and fall upon isolated or salient rocks in the above localities, they are seen in myriads, either poising themselves in the rays, or reposing on the spots on which the rays fall.'

In addition to this notice we may add that all the known species are from the tropical parts of the Old World.

DIOPTASE or *emerald copper*, a crystallized silicate of copper, the primary form of which is a rhomboid; its colour varies from emerald to blackish green; its lustre is vitreous; it is translucent, and sometimes transparent; it is sufficiently hard to scratch glass, though but feebly; it is brittle; specific gravity 3·278; the streak is green; fracture uneven, and cross fracture flat conchoidal. It is found in Siberia and the Bucharia; and, according to Lowitz, it consists of silica 33, oxide of copper 55, water 12.

DIOPTRICS. [OPTICS; REFRACTION.]

DIORA'MA, from the Greek word *διοράω*, to see through, a mode of painting and scenic exhibition invented of late years by two French artists, Daguerre and Bouton, which, although it does not possess some of the advantages of the panorama, produces a far greater degree of optical illusion. It has also one advantage over the panorama, in being equally suitable for architectural and interior views as for landscape; nay even more so, because the positive degree of light is more natural, and the relief of the objects becomes more deceptive. The peculiar and almost magical effect of the diorama arises, in a considerable measure, from the contrivance employed in exhibiting the painting, which is viewed through a large aperture or proscenium. Beyond this opening the picture is placed at such distance that the light is thrown upon it, at a proper angle, from the roof, which is glazed with ground glass, and cannot be seen by the spectators. Besides the light being thus concentrated upon the picture, the effect is materially increased by the spectator being in comparative darkness, receiving no other light than what is reflected from the *surface* of the painting itself. Another circumstance greatly favouring illusion is the intervening distance; and also the circumstance that the sides of the proscenium or opening are continued inwards towards the picture, so as to screen its extremities, and at the same time assist in confining the light to the scene itself. The contrast thus occasioned, and the exclusion of all other objects of vision save those represented in the painting, so that the eye has no immediate standard of comparison between them and real ones, give to this species of exhibition such extraordinary force that a very moderate degree of light will suffice to show the painting. Hence the light may be diminished or increased at pleasure, and that either gradually or suddenly, so as to represent the change from ordinary daylight to sunshine, and from sunshine to cloudy weather, or to the obscurity of twilight; also the difference of atmospheric tone attending them: all which variations give to the diorama a character of nature and reality beyond that of any other mode of painting. These transitions, in regard to light and atmospheric effects, are produced by means of different folds or shutters attached to the glazed ceiling, which are so contrived that they may be immediately opened or closed to any extent, thereby increasing or diminishing the light just as required, and otherwise modifying it. Further than this, some parts of the painting itself are transparent, and on them the light can occasionally be admitted from behind, thereby producing a brilliancy far exceeding that of the highest lights of a picture upon an opaque ground, which can be made to appear vivid and sparkling only by contrast, not by any positive increase of light on those parts of the surface. Here, on the contrary, such augmented light is admitted *through* it, in addition to that which illuminates the picture generally, an artifice which secures the advantages of painting in transparency without its defects; the objects looking more solid, and the effect being altogether more natural than when the whole of the light passes through the picture. The combination of transparent, semi-transparent, and opaque colouring, still further assisted by the power of varying both the effects and the degree of light and shade, renders the diorama the most perfect scenic representation of nature, and adapts it peculiarly for moonlight subjects, or for showing such 'accidents' in landscape as sudden gleams of sunshine and their disappearance. It is also unrivalled for showing architecture, particularly interiors, as powerful relief may be obtained without that exaggeration in the shadows which is almost inevitable in every other mode of painting.

Although hitherto employed only for purposes of public exhibition, the diorama might undoubtedly be turned to account for those of embellishment likewise in corridors and other places of that kind, where light can be obtained only from one extremity. For it should be observed that the principle is totally independent of the contrivance adopted for exhibiting two pictures, although this latter in itself enhances the attraction to the public. This may be understood by briefly describing the building erected for the purpose in the Regent's Park, London, after the plans of Messrs. Morgan and Pugin, and first opened in the autumn of 1823.

The spectatory or saloon for the visitors is a rotunda 40 feet in diameter, with a single opening or proscenium about 20 feet wide; and placed within another rotunda having two openings communicating with the picture-rooms, each of which contains a view. When a change of scene takes place the inner rotunda is turned by means of machinery beneath the floor, till the proscenium is gently shifted from the opening into one picture-room to that of the other, the two being quite contiguous. At the next change it is shifted back again, so that the whole space passed over backwards and forwards is about one third of the entire circumference, or double that portion of the circle forming the proscenium. The diorama at Berlin, erected by Carl Gropius, an eminent scene-painter, is somewhat on the same plan, yet with some slight differences. The peculiar mode just described, of turning the spectatory from one painting to the other, is adopted, as the scenes are much longer than the opening through which they are viewed, and require to be stretched on a framing, so that they cannot be either rolled up, or drawn aside in two halves, as is done with scenes of a theatre. Nevertheless, it would perhaps be found practicable to exhibit a succession of three or four views in a single 'picture-room,' by making that part of the building sufficiently spacious to allow each scene to be slided backwards or forwards, so as to be entirely out of view when drawn aside.

DIOSCO'REA, the genus of plants which furnish the tropical esculents called yams. They are perennial fleshy-rooted or tuberous diœcious plants, with annual twining stems, broad alternate leaves having a somewhat netted arrangement of their veins, and loose clusters of small green flowers. The corolla and the calyx taken together consist of six small equal segments, which, in the females, stand upon the top of the ovary. The male flowers have six stamens; the females three styles. The seed vessel is a thin compressed three-winged capsule, containing one or two membranous seeds.

The only general account of the species, which at all deserves to be consulted, is that of Dr. Roxburgh, who cultivated seventeen sorts in the Botanic Garden, Calcutta; others are known to botanists, but far from perfectly.

The common West India yam, which is often sold in the shops of London, is produced by *Dioscorea alata*. It is met with in the East Indies also, but only in a cultivated state. A figure of it is given in Rheede's 'Hortus Malabaricus,' vol. vii. t. 38, under the name of katsjil-kelengu. Its tubers are oblong, brown externally, white internally, and often of great size, weighing sometimes as much as 30lbs.; they perish after the first year, if left in the ground, having first produced the young ones that are to replace them. 'Besides the tubers the proper roots of all these plants are fibrous, springing from and chiefly about the union of the stems with the tubers, and spreading in every direction.' The stems are furnished with four crisped leafy wings, and spread to a great extent twining round trees and bushes; they often bear prickles near the ground. The first leaves that appear on the stem are alternate, the succeeding are opposite, seated on long stalks, deeply heart-shaped at the base, sharp-pointed, smooth, with from five to seven ribs. The flowers are small and green, and appear in compound panicles. The remainder of the species are very similar to this in general characters; a few short notes will sufficiently indicate their differences.

D. globosa, cultivated in Bengal under the name of chupree aloo, is most esteemed of the Indian yams. Its flowers are highly fragrant; the tubers are white internally; the leaves arrow-headed.

D. rubella, the guraneya-aloo, is another Indian sort with large tubers stained reddish immediately below the cuticle;

it is much esteemed; its tubers are sometimes three feet long; its flowers are fragrant.

Another valuable kind is D. purpurea, called lal-guranya-aloo in Bengal, whose tubers are permanently stained purple throughout.

At Malacca is cultivated another purple-rooted sort, the D. atropurpurea, whose tubers are large and irregular, and grow so near the surface of the ground as to appear in dry weather through the cracks that they make in the soil by raising the earth over them.

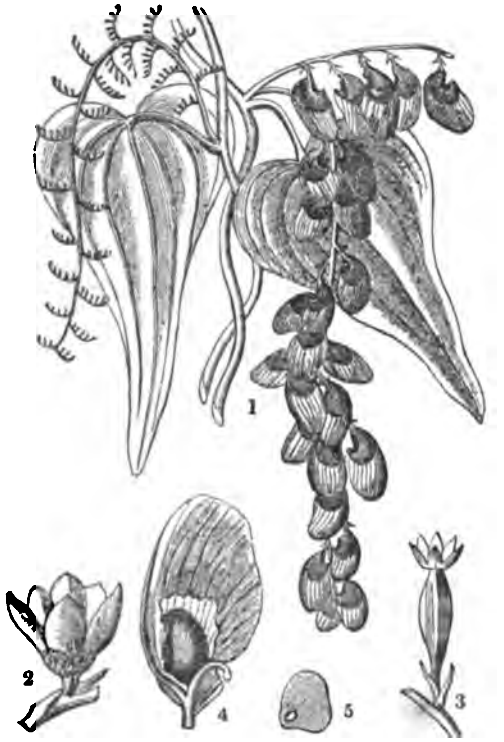
Other eatable sorts are numerous, but are less valuable, and therefore not cultivated. In Otaheite the D. bulbifera, which bears small fleshy angular tubers along the stem in the axils of the leaves, is the favourite species.

It is not a little remarkable that while so many species are nutritious in this genus, some should be highly dangerous; but such is unquestionably the fact. Dioscorea Dæmonum and triphylla, both ternate leaved species, have dreadfully nauseous and dangerous tubers. No genus is more in want of revision than this.

DIOSCOREA'CEÆ, a natural order of endogenous plants, referred to the Retose group, and having the last genus for their type. They are particularly distinguished by the following character.

Flowers diœcious; calyx and corolla superior; stamens six; ovary three-celled, with one or two-seeded cells; style deeply trifid; fruit leafy, compressed, occasionally succulent; embryo small, near the hilum, in a large cavity of cartilaginous albumen.

All the species are twining shrubs, with alternate or spuriously opposite leaves. They consist, with the exception of Tamus, or Black Bryony, of tropical plants, or at least of such as require a mild frostless climate. Some of them produce eatable farinaceous tubers, or yams, as the various species of Dioscorea and Testudinaria; but there is a dangerous acrid principle prevalent among them, which renders the order upon the whole suspicious. It exists in a perceptible degree in Tamus, and is still more manifest in the three-leaved Dioscorea.



1, a shoot of Rajania cordata; 2, a male flower; 3, a female flower; 4, a portion of a ripe fruit with the seed exposed; 5, a section of the seed.

DIOSCO'RIDES, PEDA'CIUS, or PEDA'NIUS, a Greek writer on Materia Medica, was born at Anazarbus, in Cilicia, and flourished in the reign of Nero, as appears from the dedication of his books to Areus Asclepiadeus, who was a friend of the consul Licinius or Lecanius Bassus. In early life he seems to have been attached to the army; and either at that time or subsequently he travelled through Greece, Italy, Asia Minor, and some parts of Gaul, collecting plants with diligence and acquainting himself with their properties, real or reputed. He also gathered together the opinions current in his day concerning the medical plants brought from countries not visited by himself, especially from India, which at that time furnished many drugs to the western markets. From such materials he compiled his celebrated work on Materia Medica, in five books, wherein between 500 and 600 medicinal plants are named and briefly described. He is moreover reputed the author of some additional books on therapeutics, &c.; but in the judgment of Sprengel the latter are spurious, and from the mixture of Latin and Greek names of plants, are probably some monkish forgery.

Few books have ever enjoyed such long and universal celebrity as the Materia Medica of Dioscorides. For sixteen centuries and more, to use the words of one of his biographers, this work was referred to as the fountain-head of all authority by everybody who studied either botany or the mere virtues of plants. Up to the commencement of the seventeenth century the whole of academical or private study in such subjects was begun and ended with the works of Dioscorides; and it was only when the rapidly increasing numbers of new plants and the general advance in all branches of physical knowledge compelled people to admit that the vegetable kingdom might contain more things than were dreamt of by the Anazarbian philosopher, that his authority ceased to be acknowledged.

This is the more surprising, considering the real nature of these famous books. The author introduced no order into the arrangement of his matter, unless by consulting a similarity of sound in the names he gave his plants. Thus, medium was placed with epimedium, althæa cannabina with cannabis, hippophæstum (cnicus stellatus) with hippophaë, and so on; the mere separation of aromatic and gum-bearing trees, esculents and corn-plants, hardly forms an exception to this statement. Of many of his plants no description is given, but they are merely designated by a name. In others the descriptions are comparative, contradictory, or unintelligible. He employs the same word in different senses, and evidently attached no exactness to the terms he made use of. He described the same plant twice under the same name or different names; he was often notoriously careless, and he appears to have been ready to state too much upon the authority of others. Nevertheless, his writings are extremely interesting as showing the amount of Materia Medica knowledge in the author's day, and his descriptions are in many cases far from bad: but we must be careful not to look upon them as evidence of the state of botany at the same period; for Dioscorides has no pretension to be ranked among the botanists of antiquity, considering that the writings of Theophrastus, four centuries earlier, show that botany had even at that time begun to be cultivated as a science distinct from the art of the herbalist.

The most celebrated MS. of Dioscorides is one at Vienna illuminated with rude figures. It was sent by Busbequius, the Austrian Ambassador at Constantinople, to Mathiolus, who quotes it under the name of the Cantacuzene Codex, and is believed to have been written in the sixth century. Copies of some of the figures were inserted by Dodoens in his Historia Stirpium, and others were 'engraved in the reign of the empress Maria Theresa under the inspection of Jacquin. Two impressions only of these plates, as far as I can learn, have ever been taken off, as the work was not prosecuted.' One of them is now in the Library of the Linnæan Society; the other is, we believe, with Sibthorp's collection at Oxford. They are of little importance, as the figures are of the rudest imaginable description. Another manuscript of the 9th century exists at Paris and was used by Salmasius; this also is illustrated with figures, and has both Arabic and Coptic names introduced, on which account it is supposed to have been written in Egypt. Besides these, there is at Vienna a manuscript believed to be still more antient than that first mentioned, and [illegible] others are preserved at Leyden.

The first edition of the Greek text of Dioscorides was published by Aldus at Venice, in 1499, fol. A fairer one is that of Paris, 1549, in 8vo. by J. Goupyl; but better still is the folio Frankfort edition, of 1598, by Saracenus. Sprengel laments, 'nullum rei herbariæ peritum virum utilissimo huic scriptori operam impendisse.' Nevertheless, there have been many commentators, of whom some, such as Fuchsius, Amatus Lusitanus, Ruellius, two commentators, Tragus, and Dalechampius, are of no sort of authority, while others, especially Matthiolus, Maranta, Cordus, John Bauhin, and Tournefort, among the older, with Sibthorp, Smith, and Sprengel, among modern commentators, deserve to be consulted with attention. The last edition of the Greek text is by Sprengel, in the collection of Greek Physicians by Kühn, Leipzig, 1829, 8vo., which has been improved by a collation of several MSS. Dr. Sibthorp, who visited Greece for the purpose of studying on the spot the Greek plants of Dioscorides, must be accounted of the highest critical authority; for it frequently happens that the traditions of the country, localities, or other sources of information throw far more light upon the statements of that ancient author than his own descriptions. It will ever be a subject of regret to scholars, that Dr. Sibthorp should have died before he was able to prepare for the press the result of his inquiries; what is known of them is embodied in the Prodromus Florae Graecae, published from his materials by the late Sir James Edward Smith, and in the Flora Graeca itself, consisting of 10 vols. fol. with nearly 1000 coloured plates commenced by the same botanist, and now nearly completed under the direction of Professor Lindley. [SIBTHORP.] So far as European plants are in question, we may suppose that the means of illustrating Dioscorides are now nearly exhausted; but it is far otherwise with his Indian and Persian plants. Concerning the latter, it is probable that much may be learned from a study of the modern Materia Medica of India. When the Nestorians, in the fifth century, were driven into exile, they sought refuge among the Arabs, with whom they established their celebrated school of medicine, the ramifications of which extended into Persia and India, and laid the *foundation* of the present medical practice of the natives of those countries. In this way the Greek names of Dioscorides, altered indeed, and adapted to the genius of the new countries, became introduced into the languages of Persia, Arabia, and Hindustan, and have been handed down traditionally to the present day. Thus Dr. Royle has shown, by an examination of this sort of evidence, that the Kalamos aromatikos of Dioscorides is not a Gentian, as has been imagined; that Nardos Indike is unquestionably the Nardostachys Jatamansi of De Candolle, and that the Lukion Indikon was neither a Rhamnus, nor a Lycium, but as Prosper Alpinus long ago asserted, a Berberis. With regard to the last plant, Dr. Royle states that Berberis is at the present day called in India *hooziz hindee*, or Indian *hooziz*; this last word has for its Arabic synonym *loofyon* or *lookyun*; therefore the Barberry is still called Indian lycium, with the required qualities and uses of which it moreover corresponds.

DIOSMA, a genus of Rutaceous shrubs inhabiting the Cape of Good Hope. They have alternate simple leaves, strongly marked with dots of transparent oil, and diffusing a powerful odour when bruised. Some of the species are to European taste offensive, as the Buchus, with which the Hottentots perfume themselves, and which are chiefly yielded by D. crenata and serratifolia. The flowers of most are white; those of a few are red. Diosma crenata itself, which is reputed a powerful antispasmodic, is thus described:—

An erect shrub, smooth in every part, and growing a foot or so high; branches tapering, purplish, long, lax; branchlets somewhat whorled, ternate, or scattered, angular, purple, twiggy, incurved, loose. Leaves alternate, on short stalks, ovate-oblong, blunt, flat, smooth, deep green above, paler beneath, dotted with sunken glands; the midrib somewhat keeled, the margin scolloped, glandular-dotted, and shining. Flowers solitary, white, middle sized. Peduncles filiform, shorter than the leaves.

By most modern botanists the old genus Diosma is broken up into eight, namely, Adenandra, Coleonema, Diosma proper, Euchaetis, Acmadenia, Barosma, to which the Buchus belong, Agathosma, and Macrostylis.

Diosma crenata (Linn.) and Diosma serratifolia (Vent.) yield leaves which at the Cape of Good Hope are termed bucku, or bucco, and which are sometimes used alone, but more frequently mixed. When bruised they emit a strong peculiar odour, resembling rosemary or rue. The taste is aromatic, but not bitter or disagreeable.

Cadet de Gassicourt analysed the leaves, and found no alkaloid, but 0.665 of volatile oil; 21.17 extractive; 2.15 resin; 51 lignin; 1.10 chlorophylle. Brandes considers the extractive to be peculiar, and terms it Diosmin, analogous to cathartin. The volatile oil and the extractive appear to be the active ingredients. They are usually administered in the form of infusion. Bucku leaves have been long known to the Hottentots as a remedy against rheumatism, cramps, and above all in affections of the urinary organs. They have of late years been introduced into European practice. In their action they resemble those of the arctostaphylos uva ursi, but from their containing volatile oil, bucku leaves are in many cases preferable. [BEAR'S WHORTLEBERRY.]

DIP, in magnetism, the angle which the magnetic needle, freely poised on its centre of gravity and symmetrically formed in both its arms, makes with the plane of the horizon. It is more scientifically termed the inclination of the needle, or the magnetic inclination. [INCLINATION and MAGNETISM.]

DIPHILUS. [ATHENS, vol. iii., p. 12.]

DIPHTHONG (δίφθογγος) is the sound of two vowels pronounced in rapid succession, as the German *au* in *maus*, pronounced precisely like the English word *mouse*, the vowel sound consisting of the broad *a* of *father*, followed quickly by the sound of *u* or *oo*. Again, the *i* in the English word *mind*, though represented by a single character, is virtually a diphthongal sound, consisting of the broad *a* of *father*, followed by the vowel sound which is heard in *mean*. The name diphthong however is commonly given to any vowel sound represented by the junction of two vowels, as in *dream*, though the sound produced is not compounded.

All diphthongs are said to be long syllables; and this would be true if they were only employed to mark the union of two vowel sounds. This probably was originally their sole office; for in many English words now written with diphthongs, but pronounced as if they had single vowels, an earlier pronunciation contained the double sound; and indeed this view is often supported by the provincial pronunciation of a word. For example, such words as *meat*, *dream*, are pronounced in many parts of England as dissyllables, *meät*, *dreäm*. In practice however a diphthong is often used where the vowel sound is not only uncompounded but short, as in *friend*, *breadth*.

Again, diphthongs are occasionally used to represent simple sounds intermediate between the vowels, as in the English word *cough*, and the German sounds represented by *ae*, *oe*, *ue*, commonly written *ä*, *ö*, *ü*, where the dots placed over the vowels are merely a corruption of the letter *e*.

DIPHUCEPHALA, a genus of coleopterous insects belonging to the Lamellicornes, section Phyllophagi.

This genus appears to be confined to Australia, and the species of which it is composed are distinguished from those of allied genera chiefly by their having the clypeus deeply emarginated; they are of an oblong form; the thorax is attenuated anteriorly, the elytra are somewhat depressed, and the abdomen is very convex. The antennae are eight-jointed, and the club is composed of three joints; the anterior tibiae are generally dentated externally; the anterior tarsi of the males have the four basal joints dilated, and furnished with a velvet-like substance beneath, and all the claws are bifid.

A rich golden green appears to be the prevailing colour of these insects, and we understand that they are found on flowers.

Diphucephala sericea (Kirby) is nearly half an inch in length, of a golden green hue, and has a silk-like gloss on the upper parts; the legs are red; the anterior tibiae have an obtuse tooth-like process on the outer side, near the apex; the head and thorax are very thickly and delicately punctured; the elytra are covered with confluent punctures which are arranged in longitudinal rows, and each elytron has two smooth elevated striae; the under parts of the body are covered with white scale-like hairs.

This is the largest species known; there are however many which are nearly equal to it in size. The genus Diphucephala forms the subject of a monograph in the first volume of the 'Transactions of the Entomological Society of London,' where sixteen species are described.

DIPHYDES, DIPHYDÆ, a family of zoophytes, thus characterized by M. de Blainville, and placed by him between the *Physograda* and the *Ciliograda*.

Body, bilateral and symmetrical, composed of a very small, nucleiform, visceral mass, and two natatory organs, which are contractile, subcartilaginous, and serial; one anterior, in more or less immediate connexion with the nucleus, which it seems to envelop; the other posterior, and but little adherent.

Head, at the extremity of a more or less proboscidiform stomach.

Vent, unknown; a long cirrhiform and ovigerous production, proceeding from the root of the nucleus, and prolonging itself more or less backwards.

M. Bory de St. Vincent, in his voyage to the African coasts, appears to be the first who noticed these animals, which abound in all the seas of warm latitudes, with any degree of certainty. He considered them to be *Biphores* (Salpa). Tilesius also said something of them in the zoological part of Krusenstern's voyage.

But it was Cuvier who first formed these creatures into a separate genus, under the name of *Diphyes*, and he placed them at the end of his *Hydrostatic Acalephans*, immediately after *Stephanomia* of Péron. Cuvier describes the genus as very singular, consisting of two individuals, which are always together, one including itself in a hollow of the other (l'un s'emboîtant dans un creux de l'autre), an arrangement which nevertheless permits their separation without the destruction of life. They are, he observes, gelatinous, transparent, and move very nearly like the *Medusæ*. The including individual (l'emboîtant) produces from the bottom of its hollow a chaplet (chapelet), which traverses a demi-canal of the included individual (l'emboîté), and would seem to be composed of ovaries and of tentacula and suckers like those of the preceding genera. Cuvier then goes on to state the divisions established by MM. Quoy and Gaimard, according to the relative forms and proportions of the two individuals. Thus, in the *Diphyes*, properly so called, the two individuals are nearly alike, pyramidal, and with some points round their opening, which is at the base of the pyramid. In the *Calpes*, the included individual has still the pyramidal form, but the including individual is very small and square. In the *Abyles*, the included individual is oblong or oval, and the including rather smaller and bell-shaped. In the *Cuboïdes*, it is the included individual which is small and bell-shaped; the including individual is much larger and square. In the *Navicules*, the included individual is bell-shaped; the including individual large also, but slipper-shaped (en forme de sabot). Cuvier concludes by remarking that there are many other combinations, and refers to the memoir of MM. Quoy and Gaimard, in the 'Annales des Sciences Naturelles,' tome x. This, then, is the account given by Cuvier in his last edition of the 'Règne Animal;' but it was in the first that he established the genus, and in that edition he evidently knew of only one species from the Atlantic, for which he refers to M. Bory's 'Voyage,' and places the genus among his free Acalephans, between *Cestum* of Lesueur and *Porpita* of Lamarck. It is to the first edition that M. de Blainville refers in his 'Actinologie,' and he there says that in fact M. Lesueur, more than a year previously, had sent him the drawing of a genus of the same family, to which Lesueur had given the name of *Amphiora* (Amphiroa?), and which M. de Blainville observes was, from what he now knows of the *Diphyes*, very nearly approximated to them, to say the least; but the want of information as to the characters of the genus prevented him (De Blainville) from publishing it. He remarks, that he ought to add that Lesueur was more fortunate than Cuvier, inasmuch as the former had at his disposal a complete and living animal; while the latter characterized as one *Diphyes* an animal composed of two individuals, giving as the type the anterior moiety only, to which he attributes two apertures, one for the mouth and the other for the exit of the cirrhigerous production which he regards as the ovary. M. de Blainville then, after some further observations as to the place assigned to the animal by Cuvier, refers to the 'Memoir of MM. Quoy et Gaimard,' above mentioned, and states that during the rest of their voyage those zoologists had met with more *Diphydæ*, of which they had formed distinct genera, and had submitted them to his examination; that he had also obtained some beautiful drawings of these animals, made by Lesueur in the Gulf of Bahama; and that M. Paul-Emile Botta, placed by his recommendation on board a merchant ship about to make a voyage round the world, had also communicated to him the observations which he (Botta) had been able to make on the genus; so that, difficult as the study of these singular animals may be, he thinks that he has been able to arrive at their true natural relations, aided, above all, by an examination of certain species of *Physsophoræ*. M. de Blainville then states that the body of a *Diphyes*, at first sight, and especially as it appears during life, seems to be composed of two polygonal, subcartilaginous, transparent parts, placed one after the other, the posterior portion penetrating more or less into an excavation of the anterior portion. These two parts, constantly more or less dissimilar, have this in common: viz., that they are ordinarily more or less profoundly hollowed out by a blind cavity opening externally by a very large and regular, though diversiform aperture. Adding to this a production regarded as the ovary by Cuvier, and which comes out of the superior cavity of the anterior cartilaginous part, we have the whole that had been remarked about the *Diphydæ* before the memoir of Quoy and Gaimard, who have described numerous species which they have observed, very nearly like Cuvier; with this modification, however, that they have considered the two parts as belonging to the same animal: but the study of the differences of form necessary for the establishment of the new genera which they have proposed, and above all, the good figures which they have given, have enabled them to go further, and to see in the *Diphydæ* something beyond the two subcartilaginous parts. In fact, taking for example the *Calpes*, and especially the *Cucubali* and the *Cuculli*, it is seen that the bodies of the *Diphydæ* form true nuclei, situated at the anterior part of the entire mass, and that the nucleus is composed of a proboscidian œsophagus, with a mouth having a cupping-glass-like termination (en ventouse), continuing itself into a stomach surrounded with green hepatic granules, and sometimes into a second, filled with air. There is, moreover, to be remarked, at the lower part, a glandular mass, which is probably the ovary, and is in more or less immediate relation with the cirrhigerous and perhaps oviferous production, which is prolonged backwards. This nucleus would seem to be more or less enveloped by the anterior cartilage, which offers to it, in fact, a cavity sometimes distinct from the second (which has been mentioned above), serving for locomotion, and at other times confounded with it; it is, besides, in intimate connexion with its tissue by filaments, which M. de Blainville believes to be vascular. It has been already remarked that the posterior part of the body is hollowed out by a great cavity, which is continued nearly throughout its length, and it is from the bottom of this cavity that a prolongation, perhaps equally vascular, proceeds, which goes above the root of the oviferous production, and unites itself, without doubt, with the nucleus. 'Thus,' continues M. de Blainville, 'it would appear to me certain that this part really belongs to the *Diphyes*; but it is easy to conceive how it may be detached by the slightest effort, because the union is only effected by a single filament.

After this statement of the organization of *Diphyes*, we may see that the part which M. Cuvier regarded as by itself constituting the animal, is only an organ of minor importance; that there must be added to it the posterior part, which was regarded as a distinct individual; but above all, that it is necessary to take into the account the visceral nucleus, which, with the oviferous production, forms the essential part of the animal. From this analysis of a *Diphyes*, it is evident that it cannot be an animal of the type of the *Actinozoaria*; but in order to establish its natural relationship, let us see what the observers above named have recorded of its manners and habits.

'The Diphyes are very transparent animals, so that it is often very difficult to distinguish them in the sea, and even in a certain quantity of water taken from it. It is especially at considerably great distances from the shore that they are met with in the seas of warm climates and often very numerous. They float and swim apparently in all directions, with the anterior or nucleal extremity foremost, and getting rid of the water which they take in, by the contraction of the two subcartilaginous parts; their aperture, consequently, is always directed backwards. When the two natatory organs are equally provided with a special cavity, it is probable that the locomotion is more rapid; it can, finally, be executed by either the one or the other, in proportion to their size. The posterior part is attached to the nucleus with so little solidity, that it often happens that it detaches itself from it accidentally; so that M. Botta believed that an entire *Diphyes* was only formed by one of these parts, he having but very rarely found these animals complete. During locomotion the cirrhigerous and oviferous production apparently floats extended backwards, lodging itself partly in a gutter, into which the inferior edge of the posterior natatory organ is hollowed out; but it has not the same length, the animal being able to contract it powerfully and even to the extent of withdrawing it inwards entirely; from this it is evident that this organ is muscular. But what is very remarkable is, that throughout its length, and placed at sufficiently regular distances, are found organs which MM. Quoy and Gaimard regarded as suckers, and which possessed, in fact, the faculty of adhesion and bringing the animal to anchor, as M. Botta was satisfied. I dare not decide what this organ is; but I am strongly inclined to believe either that it is a prolongation of the body analogous to that in the *Physsophoræ**, or that it is, if not an ovary, at least an assemblage of young individuals, a little like what takes place in the *Biphores*.

'In the actual state of our knowledge with regard to the *Diphyes*, it seems to me that they are, so to speak, intermediate between the *Biphores* and the *Physsophoræ*. They approach the first, whose cartilaginous envelope is sometimes tripartite, as M. Chamisso has taught us, inasmuch as that the visceral mass is nucleiform, that it is contained in great part in this envelope, that the latter has two apertures, and that it is by contraction that it executes locomotion. We find, on the other hand, a mode of approximating the *Diphyes* to the *Physsophoræ*, in regarding the natatory organs as analogous to those which we have seen in *Diphysa*, which has the smallest before and the largest behind, both the one and the other being perfectly bilateral. The mouth is also at the extremity of a sort of proboscis. There is sometimes a bullöid swelling full of air: finally, the body is terminated by a cirrhigerous production, which is perhaps oviferous. For the rest we are obliged to agree that these approximations require, before they are freed from doubt, a more complete knowledge than we at present possess, not only of the organization of the *Diphyes* and *Physsophoræ*, but also of the *Biphores* themselves. According to the views of M. Mertens, chief naturalist in the last circumnavigation of the Russians, the *Diphyes* would be no other than *Stephanomiæ;* in which case the oviferous and cirrhigerous productions of the *Diphyes* must be considered the analogues of the posterior and tubular part of the *Stephanomiæ*. We have already said that MM. Quoy and Gaimard, in their memoir on the *Diphydæ*, had established many new genera, having in view principally the form and the proportion of the two natatory organs or parts of the body. M. Lesueur has also established genera, some of which may be incorporated with those of the zoologists of the Astrolabe; unfortunately our knowledge of these genera is confined to figures only. Lastly, M. Otto has proposed one or two, but they are founded on detached parts or incomplete animals. The greater part of these genera are not, in reality, very distinct; we adopt them nevertheless provisionally at least in order to facilitate the study of beings so singular. The *Diphydæ* seem to us capable of division into two great sections, according as the anterior part is provided with a single or double cavity. M. Eschscholtz, in his systematic distribution of the species of *Diphydæ*, has regard to the number of cavities of the anterior natatory organ, and to the presence of one or more suckers in the tubular production. From this test have resulted genera otherwise circumscribed, and not less numerous than from our manner of viewing the subject.'

The following is M. de Blainville's arrangement.

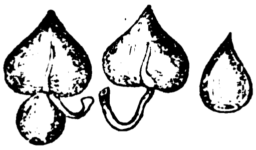
a.

Diphydæ whose anterior part has but a single cavity.

Genera, Cucubalus.

Body, provided with a large proboscidiform exsertile sucker, with a bunch (grappe) of ovaries at its base, lodged in a large single excavation of a natatory anterior cordiform organ, receiving also the posterior, which is also cordiform and hollowed into a cavity with a posterior and sub-oval orifice.

Example, *Cucubalus cordiformis*, the only species cited of the genus established by MM. Quoy and Gaimard. Length, two lines. Differs from the other *Diphydæ*, first, in having the nucleus much less hidden and sunk in the anterior natatory body, which has moreover only one large cavity in which it is plunged; secondly, in having the oviferous production very short; and, lastly, in the mode of locomotion, for the animal always swims vertically.

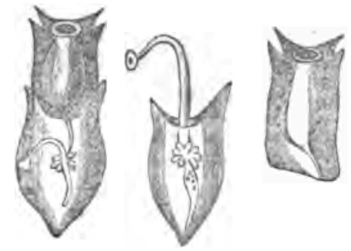


Cucubalus cordiformis.

Cucullus.

Body furnished with a great, exsertile, proboscidiform sucker, with a bunch of ovaries at its base, lodged in a deep excavation, the only one in the anterior natatory organ, in form of a hood, in which the posterior is inserted (s'emboîte); the latter is tetragonal and pierced behind with a rounded terminal orifice.

Example, *Cucullus Doreyanus* (Quoy and Gaimard) Locality New Guinea.



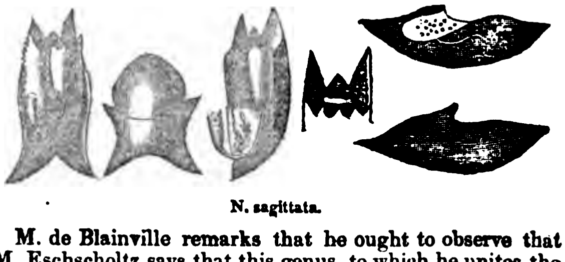
Cucullus Doreyanus.

M. de Blainville observes that this genus does not really differ from the preceding, excepting in the form of the natatory organs, and he doubts the propriety of retaining it, especially as it consists but of one species. M. Botta, he observes, who had occasion frequently to observe in nearly all the seas of warm climates, from the coast of Peru to the Indian archipelago, a great number of animals resembling the *Cucullus* of MM. Quoy and Gaimard, and having found them sometimes free and at other times forming part of the cirrhigerous and oviferous production of the ordinary *Diphyes*, has been led to think that the *Cuculli* may be only a degree of development of a *Diphyes*. Although, concludes M. de Blainville, this is conceivable up to a certain point, inasmuch as in the *Cuculli* there is no cirrhigerous production, which seems to prove that they are not adults, the difference nevertheless of the natatory organs is so great that he dares not come to this decision.

Cymba (Nacelle).*

Body furnished with a large exsertile proboscidiform sucker, having at its base a mass of ovariform organs, lodged in the single and rather deep cavity of a naviform natatory organ, receiving and partially hiding the posterior natatory organ, which is sagittiform, pierced behind with a rounded orifice crowned with points, and hollowed on its free border by a longitudinal gutter.

Example, *Cymba sagittata* (Quoy and Gaimard); *N.*† *sagittata* (De Blainville). Locality, Straits of Gibraltar.



N. sagittata.

M. de Blainville remarks that he ought to observe that M. Eschscholtz says that this genus, to which he unites the two following genera, possesses an anterior natatory organ with two cavities, and of these the natatory cavity projects in the form of a tube. M. de Blainville further observes that this genus does not differ from the *Cuculli*, except in the form of the natatory organs; in fact, the disposition of the nucleus in the bottom of the single cavity into which the anterior organ is hollowed, and the penetration of the posterior organ into this same cavity are absolutely the same as in the two preceding genera, as M. de Blainville has been able to satisfy himself from the examination of many individuals preserved in spirit.

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* This (says M. de Blainville) is the opinion of M. Eschscholtz, who gives to this part the name of *ductus nutritorius* (nourishing canal), which, he says, is simple, or provided with a single sucker, in the first section, and complex, or provided with many suckers, in the second.

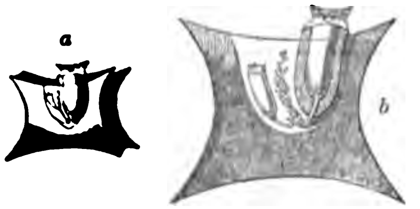
* Mr. Broderip had appropriated this name to a subgenus of Volutidæ. See Sowerby's 'Genera of recent and fossil Shells,' No. 28, and Mr. B.'s Monograph in Mr. Sowerby's 'Species Conchyliorum.'

† Navicula?

Cuböides.

Body nucleiform, provided with a large proboscidiform sucker, surrounded by an hepatic mass, having at its base an ovary, whence proceeds a filiform ovigerous production, contained in a large, single, hemispherical excavation of an anterior, cuböid, natatory organ, much larger than the posterior one, which is tetragonal, and nearly entirely hidden in the first.

Example, *Cuböides vitreus* (Quoy and Gaimard). Locality, Straits of Gibraltar.



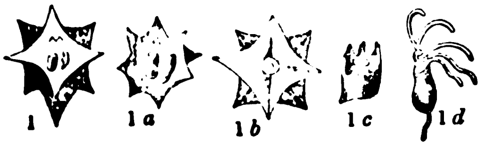
Cuböides vitreus.
a, nat. size; b, magnified.

This again, according to M. de Blainville, is a genus scarcely distinguishable from the preceding genera, and only by the form and proportion of the natatory organs. 'As,' says M. de Blainville, 'I have had a considerable number of individuals at my disposal, I have been able to satisfy myself as to the characteristic which I have given of them.' I have in fact clearly recognized that the great and single cavity of the anterior and cubic organ contained a considerable visceral nucleus, in which I have been able to distinguish a sort of proboscidiform stomach, surrounded at its base with an hepatic organ; and further backward, a granular ovary, contained in its proper membrane, and whence escaped a long ovigerous production. I have also been equally able to satisfy myself that the natatory posterior organ, of the same conformation, as far as the rest, as in the true *Diphyes*, was entirely hid in the excavation of the anterior organ with the visceral mass.

Enneagona.

Body nucleiform, provided with a large exsertile sucker, having at its base an assemblage of ovaries, whence proceeds an oviferous production. Anterior natatory organ enneagonal, containing with the nucleus in a single? excavation the posterior organ, which is much smaller, with five points, and canaliculated below.

Example, *Enneagona hyalina* (Quoy and Gaimard).



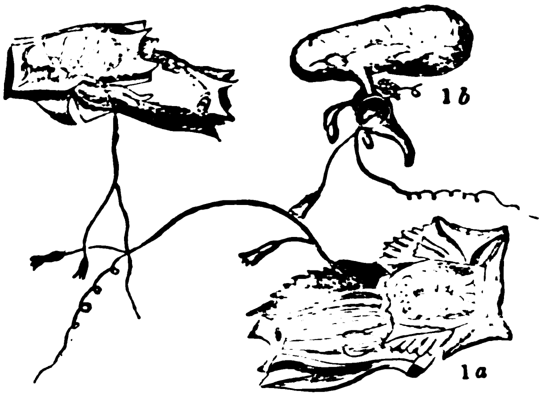
Enneagona hyalina.
1, 1 a, 1 b, Enneagona hyalina under different aspects; 1 c, visceral part; 1 d, nucleus.

Amphiroa.*

Body nucleiform, of considerable volume, furnished with a proboscidiform stomach, having at its base a bunch of ovaries, prolonged into a long filament, contained in an anterior, polygonal, short, natatory organ, cut squarely, with a single cavity in which the posterior organ, which is equally short, polygonal, and truncated, is inserted.

Example, *Amphiroa alata* (Lesueur). Locality, Seas of Bahama.

M. de Blainville observes that this genus is only known by the beautiful figures sent by M. Lesueur, and of which one reached M. de Blainville more than ten years ago, but without description, the want of which prevented him from publishing it. Nevertheless it is evident, he remarks, on referring to these figures, that the *Amphiroæ* are *Diphydæ*, but with natatory organs of a particular form and proportion. Another species, he adds, *Amphiroa truncata*, would appear to approximate nearly to the *Calpes* of MM. Quoy and Gaimard, by the great disproportion of the two parts.



Amphiroa alata.
1, 1 a, Amphiroa alata; 1 b, its nucleus extracted.

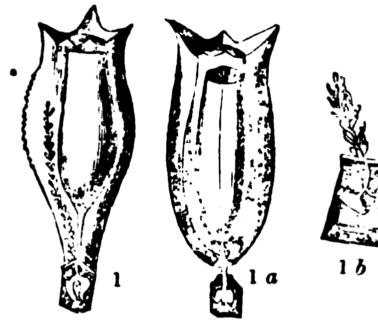
β.

Diphydæ whose anterior part is furnished with two distinct cavities.

Calpe.

Body nucleiform, without an exsertile proboscis, having a sort of aeriferous vesicle, and at its base an ovary? prolonged into a long cirrhigerous and oviferous production. Anterior natatory organ short, cuböid, having a distinct locomotive cavity; posterior natatory organ very long, truncated at the two extremities, not penetrating into the anterior organ, and provided with a round terminal aperture.

Example, *Calpe pentagona* (Quoy and Gaimard). Locality, Straits of Gibraltar?



Calpe pentagona.
1, Calpe pentagona (profile); 1 a (under side); 1 b, nucleus.

M. de Blainville observes that this genus is really sufficiently distinct from the true *Diphyes*, with which it has nevertheless many relations, not only by the great difference of the two locomotive organs, but because the posterior organ is only applied against the anterior one, and does not penetrate into the visceral cavity. He remarks that he has examined some individuals well preserved in spirit, and has easily seen that the nucleus is composed of a sort of stomach with a sessile mouth and with a small hepatic plate (plaque) of a green colour applied against it, and besides of a sort of aeriferous bladder situated behind. At the lower root of the stomachal swelling is the ovary, formed by a mass of granules, and which seems to prolong itself backwards into a long production charged with oviform bodies, and others longer and more bell-shaped. This production proceeds from the anterior natatory organ, and passes under the posterior one in following the gutter into which it is hollowed on its lower surface. Finally, this posterior organ, equally truncated at the two extremities, is hollowed nearly throughout its length into a great cavity, from the bottom of which a vessel which is continued to the root of the ovary of the nucleus may be clearly seen to proceed.

Abyla.

Body nucleiform, inconsiderable, with a very long cirrhigerous and oviferous production. Anterior natatory body much shorter than the other, subcuböid, with a distinct

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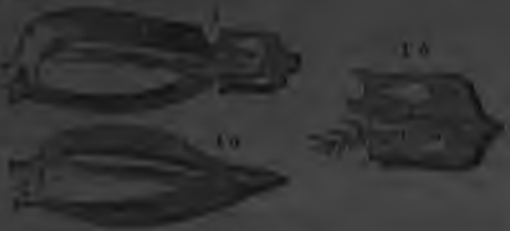
he term Amphiroa is also employed by Lamouroux and others to distin-
a genus of Corallines.

serves for the reception of the anterior extremity of the posterior natatory body, which is polygonal and very long.

Example, Calpe pentagona (Quoy and Gaimard). Locality, Straits of Gibraltar.



(Calpe pentagona.)

1, Calpe entire; 1 a, posterior part; 1 b, anterior or visceral part.

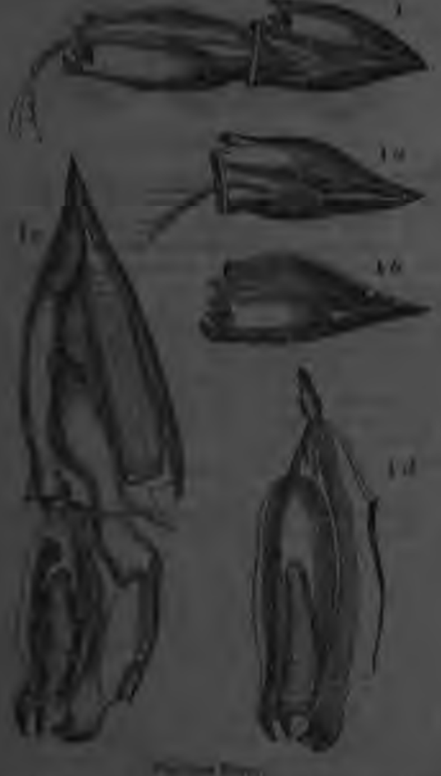
M. de Blainville observes that this genus does not really differ from the preceding, excepting in the form of the natatory organs, and above all in that the anterior part is pierced with a depression sufficiently considerable for the lodgment of a part of the other, which has a long inferior furrow (sillon) and a posterior terminal opening. To this genus M. de Blainville refers 2 species of *Diphyes*, found by MM. Quoy and Gaimard in Bass's Strait, and of which they had provisionally formed the genus *Bassia*, which does not seem to M. de Blainville to be sufficiently characterized.

M. Eschscholtz, remarks M. de Blainville, rightly unites this genus with the preceding, as well as the genus *Rosacea* of Quoy and Gaimard, the latter perhaps erroneously.

Diphyes.

Body nucleiform, indistinct, situated in the bottom of a deep cavity, whence proceeds a long tubular production, furnished throughout its extent with pedunculiform suckers, having at their root granular corpuscles and a cirrhiferous filament. Natatory bodies nearly equal and similar, the anterior with two distinct cavities, the posterior with a single one, with a round aperture provided with teeth.

Example, *Diphyes Bory* (Quoy and Gaimard); *Diphyes campanulifera* (Eschscholtz).



(Diphyes Bory.)

1, The whole animal (Diphyes); 1 a, anterior part of the same; 1 b, posterior part; 1 c, viscera magnified; 1 d, posterior part of the same.

M. de Blainville observes that the denomination of *Diphyes*, employed by M. Cuvier for a single species, which is the most common and the most generally spread at a time, is used in the work of MM. Quoy and Gaimard for species which have the natatory organs nearly equal in form and size. The first (anterior) has two deep cavities, of which the one receives a part only of the other which has a long inferior ridge for the lodgment of the ovigerous production. M. Lesson, he adds, who has equally adopted this division of the *Diphydæ*, gives it the name of *Dagysa* adopted by Solander, and also by Gmelin; but M. de Blainville asks, is it certain that the animal seen by Solander was a *Diphyes*, and not a *Biphora*? He adds, that M. Lesson has figured five species belonging to this genus, perhaps all new, and from the seas of South America.

†.

Doubtful species, or those with one part only.

Pyramis.

Body free, gelatinous, crystalline, rather solid, pyramidal, tetragonal, with four unequal angles, pointed at the summit, truncated at its base, with a single rounded aperture communicating with a single deep cavity, towards the end of which is a granular corpuscle.

Example, *Pyramis tetragona* (Otto).

(Pyramis tetragona.)

This genus was established by M. Otto, and M. de Blainville admits that he knows no more of it than is to be collected from M. Otto's description and figure. He seems to doubt, however, whether the genus may not have been founded on the posterior natatory organ of a *Diphyes*, perhaps of the *Diphyes* properly so called.

M. Eschscholtz makes this organized body a species of his genus *Eudoxia*, which comprehends *Cucubalus* and *Cucullus* of Quoy and Gaimard; admitting that the two natatory organs are intimately united so as to form, apparently, but one.

Praia.

Body? subgelatinous, rather soft, transparent, binary, depressed, obtuse, and truncated obliquely at the two extremities, hollowed into a cavity of little depth, with a round aperture nearly as large as the cavity, and provided with a large canal or furrow above.

Example, *Praia dubia* (Quoy and Gaimard).

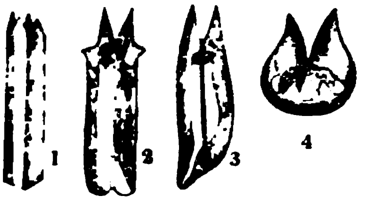
(Praia dubia.)

M. de Blainville describes, from personal observation, this provisional genus of MM. Quoy and Gaimard as being subgelatinous, rather soft and transparent. Its form, he remarks, is regularly symmetrical, and it seems to be divided into two equal parts by a great furrow which traverses it from one end to the other. It has a shallow cavity with a rounded aperture, without denticles or appendages at its circumference. In the furrow M. de Blainville perceived a mesial vessel, giving off two lateral branches, with very similar ramifications; and he is inclined to think that the form is only the natatory organ of some large species of *Physophora*: the substance is too soft for a true *Diphyes*.

Tetragona.

Body? gelatinous, transparent, rather solid, binary, of an elongated, parallelopiped, tetragonal form canaliculated below, truncated obliquely anteriorly, pierced behind by a gaping orifice furnished with symmetrical points, and leading into a long blind cavity.

Example, *Tetragona hispidum* (Quoy and Gaimard).



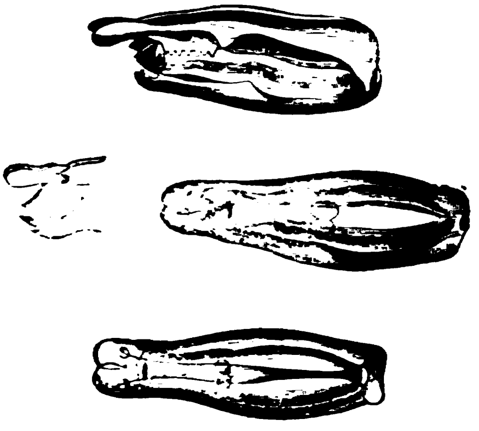
[Tetragona hispidum.]
1. Tetragona hispidum; 2, 3, 4, details of the same.

M. de Blainville is of opinion that this is only the posterior or inferior natatory organ of a true *Diphyes*.

Sulculeolaria.

Body? subcartilaginous, transparent, elongated, cylindroid, traversed throughout its length by a very large furrow, bordered with two membranes, truncated at the two extremities, with a posterior aperture, with appendicular lobes on its circumference and leading into a very long and blind cavity.

Example, *Sulceolaria quadrivalvis* (Lesueur). Locality, Mediterranean (Nice).



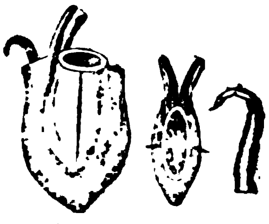
[Sulculeolaria quadrivalvis.]

A genus characterized by De Blainville, who found it established in the figures of Lesueur, from those figures; but the former is strongly inclined to believe that the genus is founded on the part of an animal, and not on an entire one. If these bodies should turn out to be merely organs or parts, M. de Blainville thinks they ought to belong to the genus *Calpe* of Quoy and Gaimard.

Galeolaria.

Body gelatinous, rather firm, perfectly regular, symmetrical, subpolygonal or oval, compressed on the sides and furnished with two lateral rows of extremely fine cirrhi. A large posterior aperture pierced in a sort of diaphragm with appendicular lobes, binary above, leading into a large cavity with muscular walls. An ovary at the anterior superior surface, coming out by a mesial and bilabiated orifice.

Example, *Galeolaria australis*, *Beröides australis* (Quoy and Gaimard).



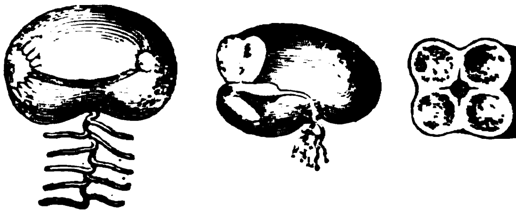
[Galeolaria australis.]

Known to M. de Blainville from the drawings of Lesueur, who gave the form the name of *Galeolaria*, which the former adopts in preference to *Beröides*, the term employed by Quoy and Gaimard. *Galeolaria* however is the name given by Lamarck to a genus of his *Serpulidæ*. From the manuscript memoir of Quoy and Gaimard lent by them to M. de Blainville, he ascertained the peculiarity of the two of cilia on each side. Botta sent him also in spirit many individuals obtained in the course of his circumnavigation. It seemed to De Blainville that these animals differed really from the *Diphydæ*, and approached the *Beröes*. To confirm this approximation it would have been necessary to find the posterior aperture of the internal canal, of which, he remarks, no observer has spoken; but it appears to him that the existence of the two series of cirrhi, their relation with a canal which follows their root, the distinct and muscular walls of the cavity, and the position of the ovary, are sufficient to show in these animals a passage at least towards the *Beröes*.

Rosacea.

Body free, gelatinous, very soft, transparent, suborbicular, with a single terminal aperture at one of the poles leading into an oval cavity which communicates with a depression, whence proceeds a cirrhigerous and oviferous production.

Example, *Rosacea Ceutensis* (Quoy and Gaimard).



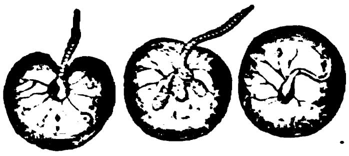
[Rosacea Ceutensis.]

Eschscholtz unites this genus with those of *Calpe* and *Abyla* under the first appellation. De Blainville, who states that he only knows the form from the figures and description given by Quoy and Gaimard, is at a loss to determine positively what it is, but he supposes it to be a *Physsophora* rather than a *Diphyes*.

Noctiluca.

Body free, gelatinous, transparent, spheroïdal, reniform, with a sort of infundibuliform cavity, whence proceeds a proboscidiform, contractile production.

Example, *Noctiluca miliaris*, Lamarck.



[Noctiluca miliaris.]

M. Surriray, a doctor of medicine, while investigating the cause of the phosphorescence of the sea-water at Hâvre, appears to have been the first who observed and called attention to the genus *Noctiluca*, which he described and figured in the memoir that he communicated to the class of sciences of the French Institute. Its size hardly equals that of a small pin's head, and it is as transparent as crystal; he found it very common in the basins at Hâvre, sometimes in such abundance as to form a considerably thick crust (croûte assez epaisse) on the surface of the water. Lamarck adopted the genus, placing it between *Beröe* and *Lucernaria*, which last, in his system, immediately precedes *Physsophora*. To these minute animals Dr. Surriray attributes the phosphorescence of the sea at Hâvre.

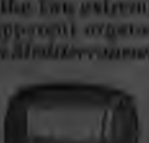
M. de Blainville states that he has often had occasion to observe these minute beings with Dr. Surriray, aided by the microscope. 'It appeared to me,' says De Blainville, speaking of *Noctiluca miliaris*, 'nearly regularly spherical but somewhat notched (fendu), or excavated on its anterior part so as a little to resemble a cherry. From the middle of the excavation proceeds a sort of long cylindrical tentacle diminishing little in size throughout its extent, and terminating in an obtuse extremity. During life this organ moves in all directions somewhat after the manner of an elephant's trunk (en se repliant, un peu a la manière de la trompe de l'elephant). It seemed to me, in fact, to be composed of annular fibres and traversed by a canal throughout its length, so that it may be supposed to be terminated by a sucker. The body is enveloped in a transparent membrane, forming sometimes irregular plaits. Within may be perceived a kind of funnel-like œsophagus (espèce d'œsophage en entonnoir) commencing anteriorly towards the pedicle and terminating posteriorly by a sort of spherical stomach. I was unable to determine whether there was an intestinal canal with an anal opening. In some individuals, but, as it would appear, at a certain period of the year only, may be seen in the interior many groups or small masses irregularly placed, and composed of a transparent envelope, containing small globules of blackish brown, which M. Suriray considers to be eggs. At a more advanced period, which M. Suriray supposes to be that of spawning, the water becomes of a red colour (d'un rouge lie de vin), and then there are found a certain number of individuals which have the pedunculiform production twice its usual length (du double plus long), and which he regards as newly-born animals. The general movements of these small animals appear to be very slow, and are essentially executed by means of the species of trunk which is continually moving from right to left. M. Suriray, who had frequently occasion to observe them, has seen them sometimes disencumber themselves entirely of their membranous envelope even to the tentacula. During life the *Noctilucæ* are eminently phosphorescent, and I have verified with M. Suriray the fact that at Havre the phosphorescence of the sea is owing to these animals; also, that in passing it through a strainer (à travers une étamine), it loses this property, which is much the strongest in warm and stormy weather, much weaker in the winter, and null under a west wind.'

(De Blainville remarks that though he arranges this animal provisionally in this section, he is far from considering that it is its true place, and that it seems to him, in fact, to have much relation with that form of which MM. de Chamisso and Eysenhardt have made their genus *Flagellina*, and which MM. Quoy and Gaimard have also designated under a particular denomination; he asks, in conclusion, whether *Noctiluca* may not be an animal near the *Cucubali* and *Cuculli*, whose natatory organs have been reduced to the membranous envelope.)

Doliolum.

Body? gelatinous, hyaline, cylindrical, truncated, and equally attenuated at the two extremities, which are largely opened and without apparent organs.

Example, *Doliolum Mediterraneum* (Otto).



[Doliolum Mediterraneum.]

M. Otto describes the organism on which he has established this genus as swimming by ejecting and absorbing the water by means of the alternate dilatation and contraction of its two orifices. M. Delle Chiaje (*Mem.*, tom. iii.) seems inclined to believe that the *Doliolum* of Otto is merely a fragment of a species of *Holothuria*, which he names *Holothuria inhærens*. De Blainville observes that if Otto's description of the motion, &c., above stated, be correct, it is probable that the animal is a true *Biphore*; but if, by any chance, there should be but one opening, then it would be the organ of some *Physsophora*, which would agree better with the total absence of internal organs.

M. de Blainville's 'Manual' was published in 1834, and in his 'Nouvelles Additions et Corrections,' dated at the Paris Museum, December, 1836, he declares his persistence in the belief that the *Physograda*, *Diphydæ*, and *Ciliograda*, ought not to be comprised in the type of the *Actinozoaria*, but that they ought to form an 'entretype,' under the denomination of *Malactinozoaria*, indicating that they are, so to speak, intermediate between the *Mollusca* and the *Radiata*. With regard to the *Diphydæ*, in particular, he remarks that since the appearance of his 'Manual,' MM. Quoy and Gaimard have published their observations on this group of animals, and that they have abandoned the different generic distinctions (coupes génériques) which they had established in their first memoirs; distinctions, in fact, which scarcely rested on more than the difference of form and the proportion of the natatory organs. 'They have, moreover, observed that their polymorphous *Biphora* (Uranie, *Zoolog.*, pl. 73, fig. 8) is certainly nothing more than a part of their *Diphyes* [illegible].

M. de Blainville then continues thus:—'The structure of the *Physsophora*, which I have named *Diphyes*, by reason of the existence of two natatory organs only, which are median and placed one before the other, and of rows of cartilaginous *squamellæ* upon the root of the cartilaginous production, does not permit a doubt of the great relationship which exists between the *Diphyes*, properly so called, and the *Physograda*; and that these two great genera ought to be united under the same family, as has been previously stated. M. Brandt has proposed to establish two subgenera only among the *Diphyes*, the first consisting of those in which the cartilaginous scales of the cartilaginous production are scattered or distant, as in *Diphyes dispar*, and the second, which he names *Diphyomorpha*, in which the scales are so close-set as to be imbricated, as is seen in the new species observed by Mertens, and named by him *Diphyes Stephanomia*. Among the genera, *incertæ sedis*, which, wrong or right, have been connected with *Physsophora* or *Diphyes*, without even being very certain that they are animals, we shall cite the two following genera intentionally omitted in our work.'

De Blainville then mentions the following:

Cupulita (Quoy and Gaimard), placed among the *Physsophoræ*, whose capsules are disposed on each side of a very long axis, established on an organized body, figured pl. 87, fig. 4–10 in the zoological part of the Voyage of the Uranie. Not having met with this animal in their second voyage, MM. Quoy and Gaimard doubt (Astrolabe, Zoolog., t. iv. p. 53 n.) whether it is an incomplete *Physsophora* or a *Stephanomia* (*Stephanomia?*) with hollow natatory organs. Cuvier places the genus between *Hippopus** and *Rhizophysa*.

Polytoma (Quoy and Gaimard, Zool. of the Uranie, pl. 87, fig. 12, 13), which may be defined to be an oval mass of globular bivalvular corpuscles (corpuscules globuleux comme bivalves), and which MM. Quoy and Gaimard conceive to be rather a *Biphore* than a *Physograde*.

Tetragona (p. 10), Quoy and Gaimard, Zool. of the Uranie, pl. 86, fig. 11). This the authors themselves (Astrolabe iv. p. 103) have recognized as being nothing more than the posterior point of *Diphyes hispida*.

Racemis (Delle Chiaje, Cuvier), figured by Delle Chiaje, Mem. tab. 50, f. 11, 12, and described as a globose vesicle endowed with a very quick motion, and disposed towards an ovate shape; but, observes De Blainville, the figures and description are too incomplete to afford a supposition of what it is; in fact, Delle Chiaje confines himself to stating that his *Racemis ovata* executes all the rotatory and rapid motions at the surface of the water, and that those of each vesicle are so lively that it has been absolutely impossible to perceive the aperture with which, according to Delle Chiaje, they are provided. Cuvier only adds to the description of Delle Chiaje, who also places *Racemis* near the *Physsophoræ*, a small membrane with which each vesicle is furnished. M. De Blainville concludes by observing that he had seen a drawing, by M. Laurillard, which had been taken at Nice from one of these organized bodies while alive, and that he supposed that it might well be a mass of eggs of *Mollusca*.

From the difficulties with which the distinguished zoologists above quoted have found this subject surrounded, and the differences of opinion expressed by them, the reader will perceive that the natural history of these extraordinary organized bodies is anything but complete; and we have laid before him the information above given in order that he may see what has been done and how much remains to be elucidated.

DI'PHYES. [Diphydæ.]

DIPHYLLI'DIA. [Inferobranchiata.]

DIPHY'SA. [Physograda.]

DIPLECTRON. [Pavonidæ.]

DIPLOCTE'NIUM. [Madrephyllicea.]

DIPLODA'CTYLUS, a genus of Lizards established by Mr. Gray, and regarded by him as forming a new genus in the family of *Geckos*.

Generic character.—*Scales* subconformable, minute, smooth; the abdominal scales rather large; the caudal scales annulate and larger; the labial scales moderate, distinct, the three anterior ones on each side much the largest; no gular scales. *Tail* cylindrical, ventricose. *Toes* 5.5, simple, subequal, subcylindrical, the points subdilated, bifid beneath, with two oval, oblique, smooth, fleshy disks;

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* Cuvier quotes this as the generic name of Quoy and Gaimard. 'Hippopus' had been preoccupied by Lamarck to distinguish a genus of conchifers in the family Tridacnidæ (the Tridacnæ of Lamarck).

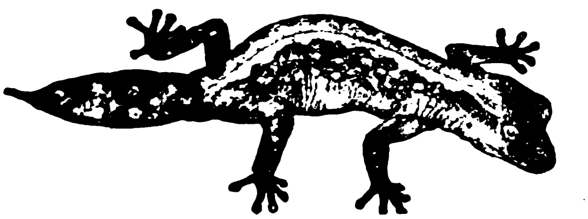
claws 5, 5, small, very retractile. No *femoral pores.* (Gray.)

This genus differs from *Phyllodactylus* of the same zoologist in having the under sides of the tips of the toes furnished with two rather large oblong tubercles truncated at the tip and forming two oval disks placed obliquely, one on each side of the claw, instead of having, as in *Phyllodactylus*, two membranaceous scales. The scales of *Diplodactylus* are, moreover, uniform, whilst in *Phyllodactylus* there is a row of larger scales extending along the back.

Example, *Diplodactylus vittatus.*

Description. Brown, with a broad longitudinal dorsal fillet; limbs and tail margined with rows of yellow spots.

There are two rows of rather distant small spots on each side of the body. the spots become larger on the upper surface of the tail, and are scattered on the limbs. Length of head and body 2 inches, that of the tail 1¼ inch. Locality, New Holland, whence it was brought to England by Mr. Cunningham. (*Zool. Proc.* 1832.)



[Diplodactylus vittatus *.]

DIPLODON, Spix's name for a genus of fresh-water conchifers, Naïades of Lea. [Naïades.]

DIPLOMACY is a term used either to express the art of conducting negotiations and arranging treaties between nations, or the branch of knowledge which regards the principles of that art and the relations of independent states to one another. The word comes from the Greek diploma, which properly signifies any thing doubled or folded, and is more particularly used for a document or writing issued on any more solemn occasion, either by a state or other public body, because such writings, whether on waxen tablets or on any other material, used antiently to be made up in a folded form. The principles of diplomacy of course are to be found partly in that body of recognized customs and regulations called public or international law, partly in the treaties or special compacts which one state has made with another The superintendence of the diplomatic relations of a country has been commonly entrusted in modern times to a minister of state, called the Minister for Foreign Affairs, or, as in England, the Secretary for the Home Department. The different persons permanently stationed or occasionally employed abroad, to arrange particular points, to negotiate treaties commercial and general, or to watch over their execution and maintenance, may all be considered as the agents of this superintending authority, and as immediately accountable to it, as well as thence deriving their appointments and instructions. For the rights and duties of the several descriptions of functionaries employed in diplomacy, see the articles Ambassador, Chargé d'Affaires, Consul, Envoy.

DIPLOMATICS, from the same root, is the science of the knowledge of antient documents of a public or political character, and especially of the determination of their authenticity and their age. But the adjective, diplomatic, is usually applied to things or persons connected, not with diplomatics, but with diplomacy. Thus by diplomatic proceedings we mean proceedings of diplomacy; and the *corps diplomatique*, or diplomatic body, at any court or seat of government, means the body of foreign agents engaged in diplomacy that are resident there.

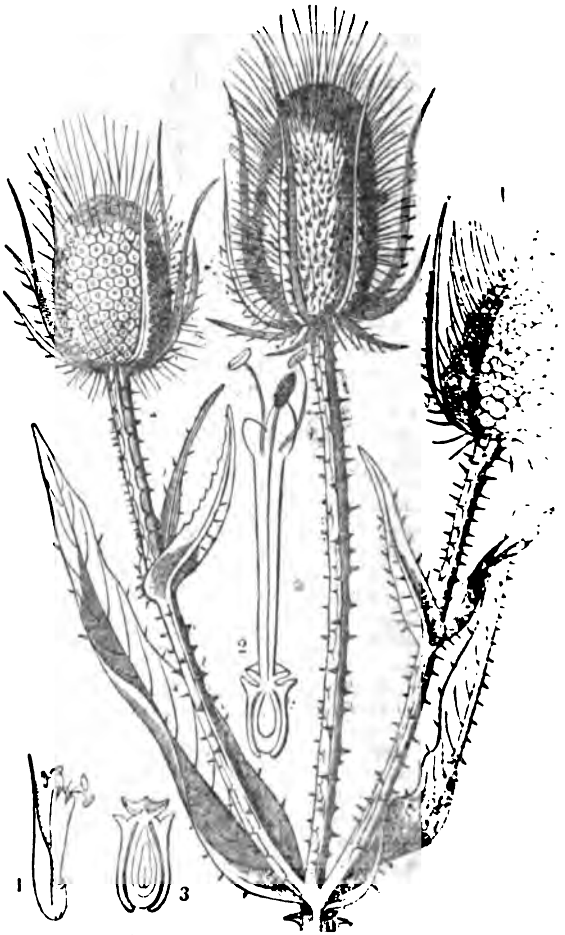
Some of the most important works upon the science of diplomatics are the following:—'Ioannis Mabillon de Re Diplomatica,' lib. vii., fol., Paris, 1681-1709, with the 'Supplementum,' fol., Paris, 1704; to which should be added the three treatises of the jesuit, Barthol. Germon, addressed to Mabillon, 'De Veteribus Regum Francorum Diplomatibus,' 12mo., Paris, 1703, 1706, and 1707:—Dan. Eber. Baringii 'Clavis Diplomatica,' 2 vols. 4to., Hanov., 1754; Ioan. Waltheri 'Lexicon Diplomaticum,' 2 vols. fol., Götting., 1745-7; 'Nouveau Traité de Diplomatique,' par les [illegible] Tassin, &c., 6 vols. 4to., Paris, 1750-65; 'Historia Diplomatica,' da Scipione Maffei, 4to., Mant., 1727; Io. Heumann von Teutschenbrunn 'Commentarii de Re Diplomatica Imperiali,' 4to., Nurem., 1745; Dom de Vaines, 'Dictionnaire Raisonné de Diplomatique,' 2 vols. 8vo., Paris, 1774; J. C. Gatterer 'Abriss der Diplomatik,' 8vo., Götting., 1798; and C. T. G. Schoenemann 'Versuch eines vollständigen Systems der allgemeinen besonders ältern Diplomatik,' 8vo., Götting., 1802.

DIPPER. [Merulidæ.]

DIPPING-NEEDLE, an instrument, the essential part of which is the magnetised needle employed to ascertain the Dip or inclination. [Inclination.]

DIPROSIA. [Pœcilopoda.]

DIPSA'CEÆ, a small natural order of exogenous plants, with monopetalous flowers, nearly allied to Compositæ (otherwise called Asteraceæ), from which it differs in the ovule being pendulous instead of erect, in the embryo being inverted, in the anthers being distinct, not syngenesious, and in the corolla having an imbricated, not valvate æstivation. In habit the species are similar to Compositæ, having their flowers constantly arranged in heads. None of the species are of any importance except the common teazle, Dipsacus Fullonum, whose prickly flower-heads are extensively employed in carding wool. Many of the species have handsome flowers, especially the Scabiouses, and are cultivated in the gardens of the curious. Purple and starry Scabions are common hardy annuals.



A portion of the upper part of Dipsacus Fullonum.

1, a flower with the hard spiny bract from which it springs; 2, a [illegible] with two of the stamens, and the ovary containing a pendulous ovule magnified; 3, a longitudinal section of a fruit, with the pendulous seed and the inverted embryo.

DIPSAS (Laurenti), *Bungarus* (Oppel), a genus of serpents placed by Cuvier under the great genus Coluber.

Description. Body compressed, much less than the head Scales of the spinal row of the back larger than the others.

Example, *Dipsas Indica*, Cuvier; *Coluber Bucephalus* Shaw.

Description. Black, annulated with white.

The subjoined cut, from Guerin (*Iconog.*) will illustrate the form.

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are indebted to Mr. Gray for the figure of this animal.

[Dipsas cynodon (Snake).]

The term *Dipsas* is also used by Dr. Leach to distinguish a genus of fresh-water conchifers; and he states that its systematic situation is between *Unio* and *Anodonta* (Anodon); *Unio* of Sowerby; *Naiades* of Lea. [NAIADES.]

DIPSASTRÆA. [MADREPHYLLIÆA.]

DIPTERA, one of the orders into which insects are divided. This name was first applied by Aristotle, and has subsequently been adopted by almost all entomologists to designate those insects the most striking characteristic of which is the possession of two wings only.

The common house-fly and blue-bottle fly afford familiar examples of this order. Some dipterous insects, however, are destitute of wings (such as the species of the genera *Melophagus*, *Nycteribia*, &c.); hence it is necessary that we should here notice other peculiarities observable in these insects.

The Diptera have six legs, furnished with five-jointed tarsi, a proboscis, two palpi, two antennæ, three ocelli, and two halteres or poisers.

The wings are generally horizontal in their position and transparent; their nervures are not very numerous, and are for the most part longitudinally disposed, a character in which the wings of dipterous insects differ from those of the orders Neuroptera and Hymenoptera.

The proboscis, situated on the under part of the head, is generally short and membranous, and consists of a sheath (or part analogous to the under lip or labium in mandibulate insects), which serves to keep in situ other parts of the mouth, which, when they are all present, represent the mandibles, maxillæ, tongue, and labium.

There are however considerable modifications in the structure of the proboscis; in some it is long, slender, and corneous, and the number of enclosed pieces, which are generally very slender and sharp, varies from two to six.

It is evident that this structure of mouth is adapted only to the extraction and transmission of fluids; and when these fluids are contained within any moderately tough substance, the parts enclosed by the sheath of the proboscis are used as lancets in wounding and penetrating so as to allow the escape of the fluid, which by their pressure is forced to ascend and enter the œsophagus.

The palpi are situated at the base of the proboscis. The antennæ are placed on the fore part of the head, and approximate at their base; they are generally small and three-jointed; the last joint, however, is often furnished with an appendage, called the stylet, which is considerably diversified, not only in form but in its position.

In some of the insects of this order, the *Tipulidæ* for instance, the antennæ are long, and composed of numerous joints; and in the *Culicidæ* they resemble little plumes.

The eyes in dipterous insects are generally large, especially in the male sex, where they often occupy nearly the whole of the head.

The halteres or poisers are two small organs of a slender form, and furnished with a knob at their apex, situated at the base of the thorax on each side, and immediately behind the attachment of the wings. These organs have been considered by many as analogous to the under wings of four-winged insects. Latreille and others, however, have come to a different opinion, from the circumstance of their not being attached to the same part of the thorax. The use of these organs is not yet ascertained; it is however supposed by some that the little knob which we mentioned is capable of being inflated with air, and that they serve to balance the insect during flight, at which time these organs are observed to be in rapid motion.

As regards the thorax, it is only necessary here to observe that the chief part of that which is visible from above consists of the mesothorax; the prothorax and metathorax being comparatively small.

The scutellum varies considerably in form, and is sometimes armed with spines; we find it developed in an extraordinary manner in the genus *Celyphus** (Dalman), where it is very convex, and covers the whole abdomen.

The abdomen seldom presents more than seven distinct segments; its form is very variable.

Dipterous insects undergo what is termed a *complete* transformation: their larvæ are devoid of feet, and have a head of the same soft substance as the body and without determinate form. The parts of the mouth exhibit variously pointed plates. The stigmata are nearly all placed on the terminal segment of the body. When about to assume the pupa state, they do not cast their skin (as is the case with the larvæ of most insects), but this becomes gradually hardened, and after a time the animal assumes the pupa state within, so that the skin of the larva forms as it were a cocoon.

There are however exceptions to this rule, for many change their skin before they assume the pupa state, and some spin cocoons.

We may here observe, that in some of the species of the genus *Sarcophaga* the eggs are hatched within the body of the mother, whence the insect first makes its appearance in the larva state; and in the Pupipara, not only are the eggs hatched within the body of the parent, but the larvæ continue to reside there until their transformation into pupæ.

As regards the habits of dipterous insects, they will be found under the heads of the several families and genera; we shall therefore conclude by noticing the two great sections into which this order is divided by Macquart. These are the Nemocera and the Brachocera.

The species of these two sections are distinguished chiefly by the number of joints of the antennæ and palpi. Their characters are as follows:—

Section 1. *Nemocera.* Antennæ filiform or setaceous, often as long as the head and thorax together, and composed of at least six joints. Palpi composed of four or five joints; body generally slender and elongated; head small; proboscis sometimes long and slender, and inclosing six lancets; sometimes short and thick, and having but two lancets; thorax large and very convex; legs long; wings long, and with elongated basal cells.

Section 2. *Brachocera.* Antennæ short, composed of three joints; the third joint generally furnished with a stylet; palpi composed of one or two joints; head usually hemispherical, and as broad as the thorax; proboscis either long, slender, coriaceous, and protruded, or short, thick, and retracted, and containing either six, four, or two lancets; thorax moderately convex; legs usually of moderate length; wings with the basal cells rather short.

The principal works on dipterous insects are, Wiedemann,

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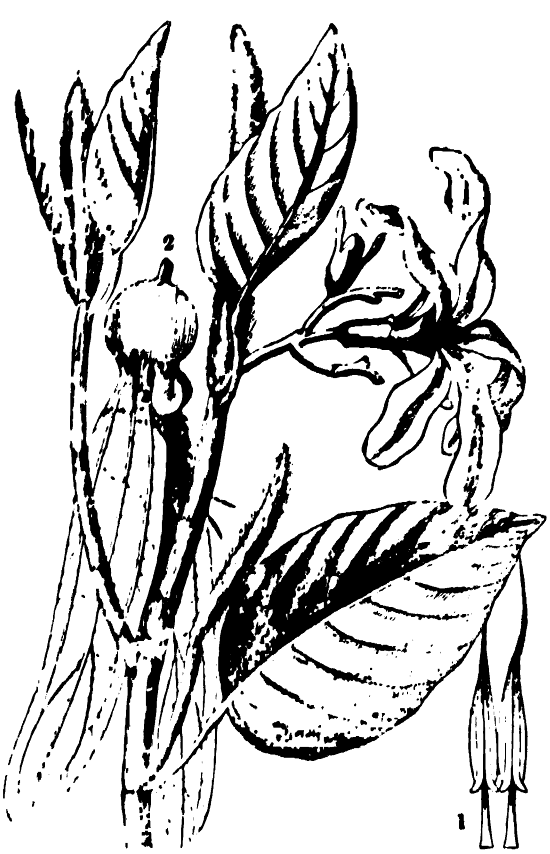
* The great development of the scutellum in the insects of this genus has its parallel in the order Hemiptera, for in the genus Tetyra the scutellum also covers the abdomen.

[illegible]

The different species produce a number of [illegible] and other substances; one a sort of [illegible], or (*Dryobalanops*); another a fragrant resin used in temples; a third from Assam: while some of the commonest pitches and varnishes of India are procured from others.



[Dipterocarpus gracilis.

1, two of the stamens; 2, a ripe fruit surrounded by the calyx whose segments have become large and leafy, and very unequal.

DIPTERAL. [CIVIL ARCHITECTURE.]

DIPTERIX. [COUMAROUNA.]

DIPTEROCARPUS, a genus of East Indian, and chiefly insular, trees, of which Blume gives the following as the essential character: 'Calyx irregularly five-lobed at the mouth; the two opposite segments very long and ligulate. Petals five, convolute when unexpanded. Stamens numerous, anthers long, linear, terminating in an awl-shaped point. Nut rather woody, and one-celled and one-seeded by abortion, inclosed in the enlarged calyx.' The species are described as enormous trees, abounding in resinous juice, with erect trunks, an ash coloured bark, strong spreading limbs, and oval leathery entire leaves, with pinnate veins. The flowers are large, white or pink, and deliciously fragrant. The [illegible] is always [illegible] when [illegible]. The [illegible] of D. [illegible], a tree from [illegible] the [illegible] of Java, is made [illegible] and when dissolved [illegible] of wine or [illegible] with white [illegible] the same way as [illegible]. The [illegible] of the Ca[illegible] of Sumatra is [illegible] in this genus; [illegible] is really a distinct genus. [DRYOBALANOPS.]

DIPUS. [JERBOA.]

DIPYRE, [illegible] a [illegible] of [illegible] and lime, which occurs in small [illegible] prisms, the primary form of which [illegible] white and [illegible]. Internally the lustre is [illegible]: translucent to [illegible]. It is found in the Western Pyrenees. By analysis it yields — silica 60, alumina 24, lime [illegible], and water 2. When heated by the blow-pipe it becomes milk white, and then fuses into a bubbly colourless glass.

DIRECT and RETROGRADE, two astronomical terms, the former of which is applied to a body which moves in the same direction as all the heavenly bodies except comets: the second to one which moves in a contrary direction. The motions of the planets round the sun, of the satellites round their primaries, and of the bodies themselves round their axes, all take place in one direction, with the exception only of the comets, of which about one-half the whole number move in the contrary direction. The course of these celestial motions is always from west to east, which is the *direct* course. The *retrograde* is therefore from east to west. The real diurnal motion of the earth being direct, the apparent motion of the heavens is retrograde, so that the orbital motion of the sun and moon has, so far as it goes, the effect of lessening the whole apparent motion: or these bodies appear to move more slowly than the fixed stars. With regard to the planets, the effect of the earth's orbital motion combined with their own, makes them sometimes appear to retrograde more in the day than they would do from the earth's diurnal motion only. [PLANETARY MOTIONS.] In the Latin of the seventeenth century, the direct motion is said to be *in consequentia*, and the retrograde *in antecedentia*. The most simple way of remembering direct motion, is by recalling to mind the order of the signs of the zodiac. From Aries into Taurus, from Taurus into Gemini, &c., up to from Pisces into Aries, is direct motion; while from Taurus into Aries, from Aries into Pisces, &c., is retrograde motion.

DIRECTION, a relative term, not otherwise definable than by pointing out what constitutes sameness and difference of direction. Any two lines which make an angle point in different directions; a point moving along a straight line moves always in the same direction. Permanency of direction and straightness are equivalent notions. A body in motion not only changes its direction with respect to other bodies, but also the direction of other bodies with respect to it.

The most common measure of direction, for terrestrial purposes, refers to the north as a fixed direction, and uses the points of the compass. But any line whatever being drawn from the point of view, the directions of all other points may be estimated by measuring the angles which lines drawn from them to the point of view make with the standard line.

When a point describes a curve, it cannot at any one moment be said to be moving in any direction at all; for upon examining the basis of our notion of curvature, we find that it consists in supposing a line to be drawn, no three contiguous points of which, however near, are all in the same straight line. But this is a mathematical notion, which is contradicted in practice by any attempt at a curve which we can make on paper. For it is found that, as must be the case from the proposition mentioned in the article ARC (vol. ii., p. 256), when two points of a curve are taken very near to each other, and joined by a chord, the widest interval between the chord and the arc disappears or becomes imperceptible long before the chord and arc disappear. Hence arises the notion that a curve may in fact be composed of very small straight lines, each of which has of course a definite direction. But though such notion must be abandoned in geometry, yet it leads to the stricter notion of a TANGENT [see also CONTACT], or of a straight line of which, as soon as the term is explained, we unhesitatingly admit: 1. That if a line moving on a curve be said to have a direction at all at any point, the direction must be that of a tangent at that point; 2. That it is highly convenient to say that a point moving in a curve is moving in a continually varying direction. Here, as in other cases [VELOCITY; CURVATURE, &c.], we obtain exactness by making definitions drawn from the inaccuracies of our senses apply, not to the notions which first gave them, but to the final limit towards which we see that we should approach if our senses were made more and more exact; but which, at the same time, we see that we should never reach as long as any inexactness whatsoever remained.

DIRECTOIRE EXÉCUTIF was the name given to the executive power of the French republic by the constitution of the year 3 (1795), which constitution was framed by the moderate party in the National Convention, or Supreme Legislature of France, after the overthrow of Robespierre and his associates. [COMMITTEE OF PUBLIC SAFETY.] By this constitution the legislative power was entrusted to two councils, one of five hundred members, and the other called 'des anciens,' consisting of 250 members. The election was graduated: every primary or communal assembly chose an elector, and the electors thus chosen assembled in their respective departments to choose the members for the legislature. Certain property qualifications were requisite for an elector. One-third of the councils was to be renewed every two years. The Council of Elders, so called because the members were required to be at least forty years of age, had the power of refusing its assent to any bill that was sent to it by the other council. The executive power was entrusted to five directors chosen by the Council of Elders out of a list of candidates presented by the Council of Five Hundred. One of the five directors was to be changed every year. The directors had the management of the military force, of the finances, and of the home and foreign departments; and they appointed their ministers of state and other public functionaries. They had large salaries, and a national palace, the Luxembourg, for their residence, and a guard.

The project of this constitution having been laid before the primary assemblies of the people was approved by them. But by a subsequent law the Convention decreed that two-thirds of the new councils should be chosen out of its own members. This gave rise to much opposition, especially at Paris, where the sections, or district municipalities, rose against the Convention, but were put down by force by Barras and Bonaparte on the 13th Vendémiaire (4th of October, 1795). After this the new councils were formed, two-thirds being taken out of the members of the Convention, and one-third by new elections from the departments. The councils then chose the five directors, who were Barras, La Révellière-Lépaux, Rewbell, Letourneur, and Carnot; all of whom, having voted for the death of the king, were considered as bound to the republican cause. On the 26th of October the Convention, after proclaiming the beginning of the government of the laws, and the oblivion of the past, and changing the name of the Place de la Révolution into that of Place de la Concorde, closed its sittings, and the new government was installed. Its policy was at first moderate and conciliatory, but it stood exposed to the attacks of two parties, the royalists, including those who were attached to the constitutional monarchy of 1791, and the revolutionists, or jacobins, supported by the mob. In September, 1796, a conspiracy of the latter, headed by Babeuf, who proclaimed 'the reign of general happiness and of absolute democracy,' proposing to make a new and equal distribution of property, made an attack on the Directory, which was repulsed by the guard, and Babeuf and other leaders were tried, condemned, and executed. By the elections of May, 1797, for a new third of the members of the councils, the royalists of various shades obtained many seats in the legislature. The policy of the Directory, both domestic and foreign, was now strongly censured in the councils, who asked for peace and economy, and for a repeal of the laws against the emigrants and the priests. The conduct of Bonaparte towards Venice was animadverted upon. Camille Jordan, a deputy from Lyon, made a speech in favour of the re-establishment of public worship. The club of Clichy was the place of meeting of the partisans of the opposition. Barthélemy, who had been meantime appointed director, inclined to the same side, as well as General Pichegru, Barbé Marbois, and others. Carnot, another director, endeavoured to mediate between the two parties, but to no effect. The Directory being alarmed, called troops to the neighbourhood of Paris, which was an unconstitutional measure. At length Augereau came with a violent message from Bonaparte and the victorious army of Italy, offering to march in support of the Directory, and threatening the disguised royalists in the councils, meaning the opposition. This was the first direct interference of the armies in the internal affairs of France. The majority of the Directory, consisting of Barras, Rewbell, and La Révellière-Lépaux, appointed Augereau military commander of Paris, who surrounded the hall of the councils, arrested Pichegru, Willot, Ramel, and prevented by force the other opposition members from taking their seats. The remainder of the members being either favourable to the Directory, or intimidated, appointed a commission which made a report of some conspiracy, and a law of public safety was quickly passed, by which two directors, Barthélemy and Carnot, and fifty-three members of the councils, were exiled to French Guiana. Carnot escaped to Germany, but Barthélemy was transported. The Directory added to the list the editors of thirty-five journals, besides other persons. Two new directors, François de Neufchâteau and Merlin de Douai, were chosen in the room of the two proscribed. This was the coup d'état of Fructidor (September), 1797. There was now a partial return to a system of terror, with this difference, that imprisonment, transportation, and confiscation of property, were substituted for the guillotine. The laws against the priests and emigrants were enforced more strictly than ever. By a law of the 30th of September, 1797, the public debt was reduced to one-third, which was called consolidated, and was acknowledged by the state, the creditors receiving in lieu of the other two-thirds bons, or bills which could only be employed in the purchase of national property, and which fell immediately to between 70 or 80 per cent. Forced loans, confiscations, and the plunder of Italy, were the chief financial resources of the government. The paper money had lost all value. [ASSIGNATS.] Government lotteries, which had been abolished by the Convention, were re-established by the Directory. A ministry of police was created, which interfered with the locomotion of individuals, by requiring passports and cartes de sûreté, and made arrests and domiciliary visits under pretence of suspicion. The periodical press was arbitrarily interfered with. In the midst of all this the Directory was mainly supported by the influence of Bonaparte's Italian victories, followed by the peace of Campo Formio with Austria. But an act which threw the greatest obloquy upon the Directory was its unprovoked invasion of Switzerland in 1798. Carnot, from his exile in Germany, was loud in his denunciations of this political crime, which he said 'verified the fable of the wolf and the lamb.' The republicans in the interior were also greatly dissatisfied with the directorial dictatorship, and as by the new elections of 1798 they mustered strong in the councils, they openly assailed the government, which was no longer supported by the presence of Bonaparte, then in Egypt. At the same time a new coalition was formed against France, consisting of Austria, Russia, England, and Turkey, and the French armies met with great reverses both in Italy and on the Rhine. In one short campaign they lost all Italy except Genoa. All this added to the unpopularity of the Directory, which that year consisted of Barras and La Révellière-Lépaux, both of the first nomination, and Treilhard, Merlin de Douai, and Sieyes. The councils demanded the dismissal of Treilhard on the score of informality in his nomination, and of La Révellière and Merlin de Douai on account of several charges which were preferred against them. All the three gave in their resignation, and were replaced by Gohier, Roger Ducos, and Moulins, three obscure men. This change took place in June, 1799. At the same time the councils circumscribed the authority of the Directory, re-established the supremacy of the legislature, and removed the restrictions on the press. But soon after, July 1799, they passed a measure worthy of the worst times of the revolution. This was the 'law of hostages,' by which the relatives of the emigrants, the ex-nobles, priests, &c., were made answerable for any revolts or other offences against the republic, and liable to imprisonment at the discretion of the local authorities, sequestration of their property, and even transportation. The authority of the Executive Directory had now become very weak and the councils themselves began to be divided between the violent republicans or jacobins, who were for measures of terror and the moderate republicans who wished to act legally according to the constitution of the year III. The [illegible] of the government was consequently [illegible]. Talleyrand, the minister for foreign affairs, gave in his resignation. All parties had exhausted themselves in ineffectual struggles, while the mass of the people were passive, being weary of agitation: this general prostration prepared the way for Bonaparte's ascendency in the [illegible] brumaire, when the constitution of the year 3 and the Directory were overthrown after four years' existence. The principal charges against the Directory are stated under the head BARRAS. See also *Histoire du Directoire Exécutif*, 2 vols. 8vo., Paris, 1802. The law of the conscription was passed under the administration of the Directory.

DIRECTRIX (*Linea directrix*, a directing line). This term is applied to any line (straight or curved) which is made a necessary part of the description of any curve, so that the position of the former must be given before that of the latter is known. Thus in the question 'required the curve described by a point in a straight line the two ends of which must be on two fixed straight lines,' the two fixed lines are directrices. Custom has sanctioned the special application of this term to lines connected with a few curves, and particularly with the ellipse, hyperbola, and conchoid of Nicomedes. But in reality, with the exception of the circle, there can be no curve which is without one or more lines to which the name of directrix might be given.

DIRGE, in music, a hymn for the dead, a funeral song. This word is a contraction of *Dirige*, the first word of the antiphona 'Dirige, Domine Deus,' chanted in the funeral service of the Catholic church. The abbreviation seems to have crept into use about the middle of the sixteenth century.

DISABILITY (Law), an incapacity in a person to inherit lands or enjoy the possession of them, or to take that benefit which otherwise he might have done, or to confer or grant an estate or benefit on or to another. All persons who are disabled from taking an estate or benefit are incapable of granting or conferring one by any act of their own, but many persons who are by law incapable of disposing of property may take it either by inheritance or gift.

Disability is ordinarily said to arise in four ways: By the act of the ancestor; by the act of the party himself; by the act of the law; or by the act of God.

By the act of the ancestor, as where he is attainted of treason or murder, for by attainder his blood is corrupted, and his children are made incapable of inheriting. But by the stat. 3 and 4 W. IV., c. 106, § 10, this disability is now confined to the inheriting of lands of which the ancestor is possessed at the time of attainder; in all other cases a descent may be traced through him.

By the act of the party himself, as where a person is himself attainted, outlawed, &c., or where, by subsequent dealings with his estate, a person has disabled himself from performing a previous engagement, as where a man covenants to grant a lease of lands to one, and, before he has done so, makes them to another.

By the act of law, as when a man, by the sole act of law without any default of his own, is disabled, as an alien born, &c.

By the act of God, as in cases of idiotcy, lunacy, &c.; but this last is properly a disability to grant only, and not to take an estate or benefit—for an idiot or lunatic may take a term either by deed or will.

There are also other disabilities known to our law, as infancy and coverture; but these also are confined to the conferring of interests.

Married women, acting under and in conformity to POWERS, and formerly by fine, but, since the 3rd and 4th W. IV., c. 74, by deed executed under the provisions of that statute, may convey lands; and infants, lunatics, and idiots, being trustees, and not having any beneficial interest in the lands vested in them, are by various statutes enabled to convey [illegible] them under the direction of the Court of Chancery.

Particular disabilities also are created by some statutes: as for instance Roman Catholics, by the 10 Geo. IV., c. 7 (the Emancipation Act), are disabled from presenting to a benefice; and foreigners (although naturalized) cannot hold offices or take grants of land under the crown. [DENIZEN.] (Coke's *Reports*; *Termes de la Ley*.)

DISBUDDING, in horticulture, consists in removing [illegible] of a tree before they have had time to grow into young branches. It is a species of pruning which has for its object not only training, but also economy with regard to the resources of a tree, in order that there may be a greater supply of nourishment for the development of those buds which are allowed to remain.

If the roots are capable of absorbing a given quantity of nutritive matter for the support of all the buds upon a stem, and if a number of those buds be removed, it must be evident that those which remain will be able to draw a greater supply of sap and grow more vigorously than they otherwise would have done. This fact has furnished the principles of disbudding.

This kind of pruning has been chiefly applied to peach and nectarine trees, but the same principle will hold good with all others of a similar description, and might be practised upon them if they would repay the labour so expended.

The French gardeners about Montreuil and in the environs of Paris have carried this practice to a great extent, and with considerable success.

Several of their methods have been described by Dr Neill, the secretary of the Caledonian Horticultural Society, in his horticultural tour. In one of them, termed *à la Sieulle*, and invented by Sieulle, gardener at Vaux Praslin, near Paris, the training is made to depend entirely upon the exactness of disbudding.

The peculiarity of Sieulle's method is as follows:—After the stock has been budded, two branches are trained at full length to a trellis or wall; late in autumn or in winter all the buds, with the exception of four on each shoot, are neatly cut out, or disbudded; these four in their turn form shoots in the succeeding summer, which are cut down to about one-third of their length in autumn, and also disbudded in the same manner as the two principal branches of the preceding year. This kind of pruning being always performed prevents a superfluous development of buds, and the consequent necessity of cutting them out as branches in the following season. Du Petit Thouars, whose opinions are entitled to much respect, passes a high eulogium upon this system of Sieulle: he says, 'by this method the young tree is more quickly brought to fill its place upon the espalier; it is afterwards more easily kept in regular order; many poorer flower-buds are allowed to develop themselves, but the necessity of thinning the fruit is thus in a great measure superseded, and the peaches produced are larger and finer.'

Dumoutier's system of disbudding is somewhat different from Sieulle's. Instead of performing this operation late in autumn, he defers it until spring, when the buds are unfolded; all those upon the young shoot of the previous year, with the exception of the lowest and the one above the highest blossom, are then carefully removed; of the two which are left, the first is termed the *bourgeon de remplacement* for the next year, and the latter is allowed to remain to draw up the sap for the maturing of the fruit. This method of pruning, as far as disbudding is concerned, is precisely the same as that practised by Seymour of Carleton Hall in England.

It must not be thought however from this statement that the training of Dumoutier and Seymour is the same, or that their trees assume precisely the same appearance. For example, Dumoutier's branches proceed from two principal arms, Seymour's from one in the centre; in the system of the former, the fruit-bearing branches are on both sides of the old wood; while in that of the latter they are only allowed to grow from the upper sides.

Disbudding in spring is frequently and beneficially practised by many intelligent gardeners, both in England and Scotland, upon English fan-trained peach-trees, with a view to thinning the young wood, taking care to leave enough for the production of fruit in the following year.

When spurious buds can be removed from peach or nectarine trees before development, with the certainty of those succeeding which are allowed to remain, it must be of material consequence, as the latter will not only be better supported, but will also receive a greater quantity of light, so essential to mature and ripen the young wood. Unfortunately however Sieulle's plan cannot be practised with any degree of success in England; those buds which are left, and upon which so much dependence is placed, often do not grow; a vacancy is the consequence, and the tree is deformed. The climate of Montreuil is much more favourable to the growth of the peach-tree than that of Britain, and although the winters of Paris are severe, yet the mea degree of summer heat is much greater there than in any part of England; and perhaps the peculiar nature of the soil renders peach-trees much more yielding to art there than in this country.

For these reasons, however useful the plan of disbudding in autumn or winter may be in the gardens of France, it would be improper to practise it to any extent in those of England. The system has been fairly tried in the garden of the London Horticultural Society, but has long since been discontinued.

It has however been proved, both there and from the long experience of men in private situations, that a judicious thinning of the buds after they have been unfolded in spring (when an experienced individual can foresee the strength of those which he is about to leave, and to which he looks for his fruit in the following year), is of great utility.

DISC (*δίσκος, discus*), is used for the face of a circular plate, and frequently for a thin plate of any substance. Thus we speak of the sun's *disc* (referring to the appearance of the sun), and also of a disc of metal.

DISCIPLINE, MILITARY, the series of duties which are to be performed by military men. It also signifies a conformity to the regulations by which those who serve in the army are governed in all matters relating to the practice of their profession.

DISCLAIMER (*Law*), a plea by a tenant in any Court of Record in which he disclaims to hold of his lord. This disclaimer of tenure is a forfeiture of the lands to the lord upon reasons most apparently feudal. And so likewise if in any Court of Record the particular tenant does any act which amounts to a virtual disclaimer, as if he claims a greater estate than was granted to him, or takes upon himself those rights which belong only to tenants of a superior class, or if he affirms the reversion to be in a stranger, by attorning as his tenant, collusive pleading, and the like, such behaviour amounts to a forfeiture of his particular estate. The writ of right sur disclaimer was the old form in which the lord took advantage of the forfeiture; but as it was decided that the tenant might be treated as a trespasser, and that notice to quit was not necessary, the more convenient action of ejectment was generally used, and now since the stat. 3 & 4 W. IV., c. 27, the proceeding by writ of right sur disclaimer is abolished.

Where a person by his plea denied that he was of the blood of another, he was also said to disclaim; and there is a disclaimer of goods as well as lands, as where on an arraignment of felony a man disclaims the goods, in which case, though he should be acquitted, he loses the goods.

One of the pleadings in a suit in Chancery is also called a disclaimer, as where a defendant, in his answer to the complainant's bill, disclaims all interest in the matter in question. [EQUITY.]

And where an estate is given either by deed or will to a person, he may by deed (which need not be enrolled, or, as it is called, made matter of record) disclaim all interest thereunder; but it seems that for this purpose a deed is necessary, and that a parol disclaimer would not be sufficient.

An executor is said to disclaim when he renounces probate of the will of his testator; and this is generally effected by verbal renunciation before some judge spiritual, or by simple writing under his hand, in either case the disclaimer being recorded in the spiritual court; but where the will contains a devise of lands to the executor, the disclaimer is generally made by deed; for although a disclaimer by the beforementioned means would, it seems, be operative, yet the deed is preferred as affording evidence, in deducing a title to the lands, of the fact of disclaimer.

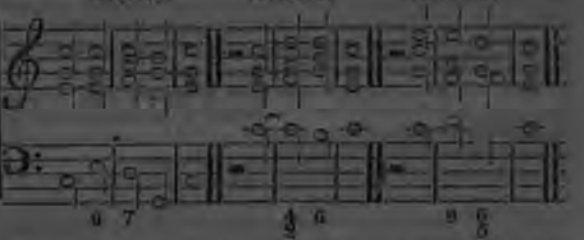
DISCONTINUITY (*Algebra, &c.*). Continuous changes are those which are so made that no two states exist without every possible intermediate state having been in existence between them. Thus the square on a line of 4 inches contains 16 square inches, while that on a line of 5 inches contains 25 square inches; and there is no possible area between 16 and 25 square inches which is not equal to the square described on some line between 4 and 5 inches. That is, if a straight line increase continuously, the square described on it increases continuously.

The first introduction of discontinuity arises from the attempt to represent all magnitudes by numbers. Arithmetical symbols cannot represent continuous change of magnitude. If a foot be divided into 2, 3, 4, &c. equal parts, *ad infinitum*, there are still infinite numbers of lengths which will not be represented by any whatsoever of the resulting fractions of a foot. Hence the difficulties of INCOMMENSURABLE magnitudes, which arise from the failure of the attempt to represent flowing or continuous changes by the means of changes which always suppose finite intervals as in passing from number to number.

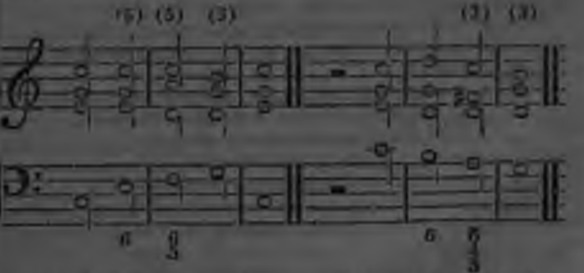
But the arithmetical difficulty, being introduced antecedently to the express consideration of discontinuity, is rarely treated as belonging to this subject. In the higher parts of mathematics the necessity for the consideration of discontinuous expressions began with the investigation of partial differential equations. In the introduction of the arbitrary functions which these equations require, discontinuous functions were thought to be admissible by Euler, an opinion which was controverted by D'Alembert, and supported, conclusively, it has always been thought, by Lagrange. It is our own opinion that not only the arbitrary function of a partial equation, but even the arbitrary constant of a common equation, may be allowed to be discontinuous, unless the contrary be a condition of the problem, expressed or implied. By a discontinuous constant, we mean one which preserves one value between certain limits of the value of the variable, which then suddenly changes its value, preserving the new value till the variable attains another limit, and so on.

The subject has begun to force itself on the attention of mathematicians, and several remarkable cases have been pointed out in which erroneous conclusions have been arrived at for want of considerations connected with discontinuity. There is a full account of the state of this question in Mr. Peacock's 'Report on Analysis.' (*Rep. Brit. Ass.*, 1834.)

DISCORD, in music, a sound which, when heard with another, is disagreeable to the ear, unless treated according to the rules of art. Discords are the 2nd, sharp 4th (Tritonus), flat 5th (Semidiapente), minor or flat 7th, and major or sharp 7th. The ratios of these are 9 : 8, 45 : 32, 64 : 45, 9 : 5, and 15 : 8. The 9th (9 : 4) is also a discord, and though only the octave to the 2nd, is considered in harmony as a very different interval, and treated in a different manner. The 4th (4 : 3) is either discord or concord, according to the manner in which it is accompanied. [CONCORD.] Discords commonly, but not always, are *prepared*; *i. e.*, the note which is to become the discord, is first heard as a concord; and their *resolution* is absolutely necessary; *i. e.*, the discord must pass into a concord, though the resolution is occasionally retarded. Examples:—



The perfect 5th in the chord of $\frac{6}{5}$, and the 3rd in the chord of $\frac{4}{2}$ are treated, as far as regards resolution, as discords. Examples:—



DISCOUNT, a sum of money deducted from a debt in consideration of its being paid before the usual or stipulated time. The circumstance on which its fairness is founded is, that the creditor, by receiving his money before it becomes due, has the interest of the money during the interval. Consequently, he should only receive so much as, put out to interest during the period in question, will realize the amount of his debt at the time when it would have become due. For instance, 100*l.* is to be paid at the end of three years, what should be paid now, interest being 4 per cent.? Here it is evident that if we divide the whole debt into 112 (or 100 + 3 × 4) parts, 100 of these parts will make the other 12 in three years (at simple interest), whence the payment now due is the 112th part of 10,000*l.* or 89*l.* 5*s.* 9*d.* The rule is, *n* being the number of years (a fraction or number and fraction), *r* the rate per cent., and D the sum due,

$$\text{Present value} = \frac{100\,D}{100+nr}\,;\ \text{discount} = \frac{Dnr}{100+nr}.$$

In practice, it is usual not to find the real discount, but to allow interest on the whole debt in the shape of abatement. Thus it would be considered that, in the preceding example, three years' discount upon 100*l.* at 4 per cent. is 12*l.*, or 88*l.* would be considered as the present value.

In transactions which usually proceed on compound interest, as in valuing leases, annuities, &c., the principle of discount is strictly preserved. The present value in the preceding case is, in its most usual form,

$$\frac{D}{(1+\rho)^n},\ \text{and the discount}\ D-\frac{D}{(1+\rho)^n};$$

where ρ is the rate per pound (not per cent.: thus it is ·04 for 4 per cent.). But recourse is usually had to the tables of present values which accompany all works on annuities or compound interest. [INTEREST.]

The name of discount is also applied to certain trade allowances upon the nominal prices of goods. In some branches of trade these allowances vary according to the circumstances which affect the markets, and what is called discount is in fact occasioned by fluctuations in prices which it is thought convenient to maintain nominally at unvarying rates. This system is practised in some branches of wholesale haberdashery business, and we have now before us a list of prices furnished to his customers by a manufacturer of tools at Sheffield, in which the nominal price of each article is continued the same at which it has stood for many years, while to every different species of tool there is applied a different and a fluctuating rate of discount, this fluctuation constituting in fact a difference of price between one period and another: the rates of discount in this list vary from 5 to 40 per cent. upon the nominal prices of the different articles.

The term discount is also employed to signify other mercantile allowances, such for example, as the abatement of 12 per cent. made upon the balances which underwriters, or insurers of sea risks, receive at the end of the year from the brokers by whom the insurances have been effected. The word discount is further used, in contradistinction to premium, to denote the diminution in value of securities which are sold according to a fixed nominal value, or according to the price they may have originally cost. If, for example, a share in a canal company upon which 100*l.* has been paid is sold in the market for 98*l.*, the value of he share is stated to be at 2 per cent. discount.

DISCOVERY, in Law. [EQUITY.]

DISCUS (*δίσκος*, *discos*), a quoit of stone, brass, or iron, with which the Greeks and Romans diverted themselves in the public games. The word is Greek. The discus, when perforated like our modern quoit, was thrown by the help of a thong, put through the middle of it. It was at other times of a solid piece, and was then hurled directly from the hand. This last method is illustrated by the celebrated statue of the Discobolus, or quoit thrower, attributed to Myro, an antient copy of which is among the marbles of the Townley Gallery. The figure is represented in action at the precise moment of delivering the discus. Ovid (*Metam.*, li. x., *v.* 175) and Statius (*Theb.*, vi., *v.* 646) have both described the diversion of the discus; see also Petri Fabri *Agonisticon, sive de Re Athletica, Ludisque Veterum*, 4to., Lugd. 1595, li. ii., c. i.

The term discus was likewise applied to circular shields or bucklers, of a large size, placed in the temples, on which great actions were represented, or the names of those who had devoted themselves to the service of their country inscribed. One of the former of these is in the Townley Gallery at the British Museum, Room iii., No. 36, containing the names of the ephebi of Athens under Alcamenes, when he held the office of cosmetes. Such too was the shield of Scipio Africanus, found in the Rhone in 1656, engraved in Spon's 'Miscellanea Eruditæ Antiquitatis,' edit. 1685, p. 152. Anacreon has an ode on a disk representing Venus rising from the sea: Od. 51, *Εἰς Δίσκον ἔχοντα Ἀφροδίτην.* See likewise Montfaucon, *Supplem. de l'Ant. Expliq.*, liv. iii., p. 64.

DISDIAPA'SON, the name given by the Greeks to a scale of two octaves. [DIAPASON.]

DISK, a term in botany signifying any ring or whorl of glands, scales, or other bodies that surround the base of an ovary, intervening between it and the stamens. In its most common state it is a fleshy wax-like ring as in the orange; it frequently forms a yellowish lining to the calyx, as in the plum and cherry, and not unfrequently rises up like a cup around the ovary as in the tree pæony. The latter renders it probable that the disk is nothing but an inner whorl of rudimentary stamens. Previously to the expansion of the flower the disk contains fæcula, and is dry and brittle; but after the blossom unfolds it perspires a sweet honey-like fluid, and becomes tough, absorbing oxygen and parting with carbonic acid. This phenomenon is similar to what occurs in the germination of seeds, and has led M. Dunal to the opinion that the conversion of the fæcula of the disk into sugar is for the purpose of forming a store of nutritive matter for the stamens and ovary at the time of fertilization, just as the same phenomenon in the germination of seed is for the purpose of supplying food to the young embryo.

DISLOCATION. Various parts of the body are liable to be displaced by the direct application of violence or by more gradual causes. But the term *dislocation* is commonly appropriated to displacements occurring about the joints. In this sense it is nearly synonymous with *luxation*, but not entirely; for the latter term carries with it more of the idea of external force, and is not quite so generally applied. It is usual, for instance, to speak of the *dislocation*, not the *luxation*, of the internal cartilage of the knee; and the latter term is seldom if ever used in describing the displacements of the small bones of the wrist or instep, or of single vertebræ.

The injuries classed under this title may be effected by external violence, or by the undue contraction of muscles, or by both of these causes combined; and they result in some instances from disease within the joints themselves, by which their ligaments are weakened or destroyed, and their sockets rendered insecure by ulceration and other gradual changes.

When, by the protrusion of the bone through the skin or otherwise, the dislocation is complicated with an external wound exposing the cavity of the joint, it is said to be *compound*: and, as in the parallel case of fracture, this aggravation of the injury is very serious, and the most skilful management is required to save the life or limb, where the injury happens to one of the larger joints.

The particular dislocation takes its name either from the joint itself or from the furthest bone; and various terms are added to indicate the direction of the displacement, or the new situation of the head of the bone. Thus the most common form of the accident at the hip is called 'a dislocation of the head of the *femur*' (thigh-bone) '*backwards* upon the *dorsum ilii*' (flat part of the haunch-bone).

Any bone may be displaced in any direction, but the accident happens most frequently in those joints and directions in which the extent of motion is the greatest. Thus the most common dislocation is that of the shoulder, which is the most movable joint; and its most frequent variety is that in which the head of the *humerus* (or bone of the upper arm) is drawn downwards into the *axilla* (or arm-pit) by the sudden contraction of certain strong muscles. This happens when the arm is raised to the utmost, as in reaching to close a window; that is when it has moved through an angle of 180° degrees from its natural position. The most usual dislocation of the hip is that, already mentioned, on the *dorsum ilii* for the same reason. It is generally produced by sudden pressure or a blow on the knee when the thigh is bent upon the abdomen; the head of the *femur* is thus driven backwards from the socket, and is then drawn farther back and upwards by the powerful muscles of the buttock.

The jaw is sometimes thrown out of joint by the mere act of yawning; and that accident happened to a gentleman known to the writer in opening his mouth to make the usual response at church. The word was cut short at the first syllable; for in such cases the chin suddenly drops and is thrown forward, and it is impossible by any effort to shut the mouth. This distressing but irresistibly ludicrous accident may be relieved immediately by any bystander wrapping a napkin round his thumbs and placing them firmly against the back teeth, so as to press them downwards, while with the fingers and palms the chin is steadily raised and pushed backwards. But the operator should be on the alert to withdraw his hands the moment the jaw snaps back into its place, or he may receive a very unpleasant intimation of the success of his efforts.

It will be easily seen from these instances how important a part is played by the muscles in determining both the occurrence and direction of these accidents. Hence arises in part their infrequency, often wondered at, during infancy and childhood; for though the flexible joints of the young have a greater extent of motion than those of the adult, their muscular power is not only weaker as compared with the strength of their ligaments, but is much more tardily thrown into action, as may be observed in their tottering gait. The fragility of their bones is another cause of this infrequency, by rendering them more liable to be broken than displaced by external violence. The only dislocation that is at all common in children is that of the hip, which is the consequence of scrofulous ulceration of the ligaments and the socket, and of the ball-shaped head of the femur within it.

The reader will be prepared by what has been said to learn that the spasmodic and violent contraction of the muscles consequent upon these displacements is the chief or only obstacle to their reduction.

This object is effected by a process technically called *extension*, consisting in the application of force in a proper direction, and steadily kept up till the muscles are fatigued. The head of the bone is thus drawn down a little below the level of the joint; and being lifted over the edge of the socket, slips easily into its place upon slightly relaxing the extending force. This force is often required to be very considerable, and in such cases it is customary to make use of a block of pullies, the bone which contains the socket having been first securely fixed to a staple in the wall by proper bandages. Luxation of the hip is here supposed; for the other joints are so inferior to that in strength that their displacements may generally be reduced by less imposing means. It is sometimes necessary to favour the relaxation of the muscles by emetics, warm baths, and bleeding, and it is reckoned a point of good management to call off the attention of the patient during the extension by annoying him with questions and even exciting him to anger.

Almost all dislocations arising from accident may be reduced in this way, and the joint rendered nearly or quite as perfect as before: but this can only be done on condition of perfect rest during a period sufficient for the firm union of the ruptured ligaments; for if this precaution be not strictly observed, and the ligaments are suffered to be stretched by motion while the uniting substance is soft and extensible, the accident is ever afterwards liable to recur. No time should be lost in seeking assistance, for the swelling that comes on soon renders the nature of the accident obscure, and the reduction extremely difficult and painful. When a joint has been unreduced for a certain time, which varies with the particular joint, and with the bodily strength of the individual—the weaker having the advantage in this respect—it is unwise to make any attempt at reduction. The parts have now become consolidated and adapted to their new situation, and either the limb is permanently fixed or a new joint is under process of formation. In the latter case the substitute is often better than might be expected; and as this curious provision of nature cannot be improved upon by art, it is better to leave it alone.

The most dangerous dislocations are those of the vertebræ or bones of the spine, because in that case all the parts of the body below the injury are paralyzed. But the vertebræ are so curiously locked together, and have singly so little motion, and are at the same time so well supported by ligaments and muscles, that they are seldom dislocated unless by a force sufficient to break as well as to displace them. Such an injury is almost always fatal, and instantly so in general when it takes place above the origin of the nerves of respiration, that is, above the fourth vertebræ of the neck. The object of the executioner in hanging a criminal is to produce this effect, but he more often fails than succeeds.

It would be out of place in this work to describe the various dislocations more particularly. The reader will find some additional information on the subject under the head of JOINTS. The best English treatise upon it is the large work of Sir Astley Cooper.

DISMAL SWAMP. [CAROLINA, NORTH; VIRGINIA.]

DISPART, the difference between the semidiameter of the base ring, at the breech of a gun, and that of the ring at the swell of the muzzle.

On account of the dispart, the line of aim, which is in a plane passing through the axis of the gun, always makes a small angle with the axis; so that the elevation of the latter above the horizon is greater than that of the line of aim: an allowance for the dispart is consequently necessary in determining the commencement of the graduations on the tangent scale, by which the required elevation is given to the gun.

DISPENSARY, an institution supported by voluntary contributions for the supply of the poor with medical and surgical advice, and with medicines gratuitously. Institutions of this kind are of very recent origin. They differ from hospitals in this, that the sick, when too ill to attend personally at the institution, are visited at their own homes by the medical officers of the charity. Each dispensary indeed is restricted to a certain district, beyond the limits of which the patients are not visited at their own houses. To every dispensary there are always attached one, and sometimes two physicians; one surgeon, and often a consulting surgeon, and a resident medical officer who dispenses the medicines prescribed by the physicians and surgeons. Every subscriber to the institution who pays annually a certain sum is called a governor, who is entitled to have at least one patient always on the books; a person who subscribes a larger amount in one sum is called a life-governor, who may have two or more patients on the list. The medicines, which are commonly purchased in considerable quantities at a time and at wholesale prices, are dispensed in unexpensive forms, and in this manner the extent of the relief afforded is great, while the cost is trifling. No other kind of charity affords so much real assistance at so small an expense, and perhaps fewer objections apply to this than to any other mode of giving eleemosynary aid to the poor. Its peculiar excellence is that it enables the sick poor to obtain advice on the very first day of their illness. Even the great metropolitan hospitals are often so full that urgent cases are constantly obliged to wait days and even weeks before admission can be obtained; but by means of the dispensary poor families, and even the heads of such families in regular employment, may procure medical and surgical assistance without leaving their occupation even for a day. It would be a great improvement in the principle of these institutions if some contribution towards their support on the part of the poor themselves were required to entitle them to avail themselves of the advantages which they afford. This would remove the only objection that can be urged against such establishments, and would enable the independent labourer, without asking charity, to procure the best advice for his sick family at a much cheaper rate than he can possibly do at present.

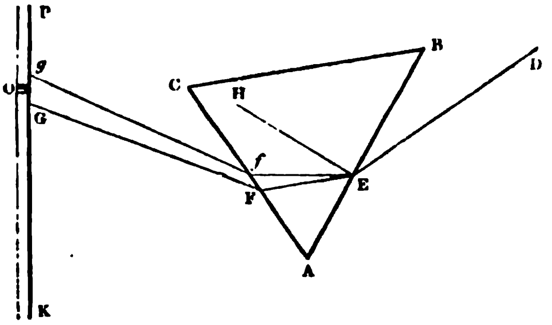
DISPENSATION (Law). The only kind of dispensation now used is that by which the bishop of a diocese licenses a clergyman within his jurisdiction to hold two or more benefices according to their value, or to reside out of the bounds of his parish, or dispenses with some other particular of his strict duty.

Formerly, not only in ecclesiastical jurisprudence, but also in the civil and criminal codes, the subject of dispensations occupied a large space. They formed a great source of the revenue of the court of Rome; for the pope's dispensations prevailed against the law of the country in many if not most instances, indeed in all of an ecclesiastical nature; this abuse was however abolished by the statute 25 Henry VIII., c. 21; and the power of the pope to grant dispensations not contrary to the law of God, but only to the law of the land, was granted to the archbishop of Canterbury under certain restrictions. It is hardly necessary to state that from the spirit of the times this power is never exercised in civil cases, and but in a few cases of purely ecclesiastical cognizance, and in those the usage has become the law rather than the exception. This right of the archbishop in some cases, as to grant special licences of marriage, &c., has been expressly recognized by the legislature.

Formerly also the crown claimed a dispensing power, by which it could exempt a person from the ordinary liabilities to the laws of the realm: the limits of this power were never exactly defined, but in consequence of the gross abuse of it during the reign of James II., it was expressly abolished by the Bill of Rights on the accession of William and Mary.*

DISPERSION. Light, as we receive it from the sun or from other original sources as a star, a fire, a candle, &c., appears to the senses as a simple undecomposable element by the instrumentality of which objects are perceived; and as for the peculiar colours of bodies, we naturally consider them, according to our early impressions, as belonging to the bodies themselves, or inherent in them. We are partly undeceived in this view by the changing colours of birds' feathers, soap-bubbles, compound silk textures, &c., but we are enabled to trace the immediate cause of the colours of bodies, whether permanent or transient, by the analysis of light furnished by the well-known experiments of the glass-prism.

The triangular prism used for this purpose is a solid, terminated by two equal and exactly similar triangles, and having besides three plane faces of a rectangular form, contained by the sides of the triangles and by right lines or edges joining corresponding angles of the two triangular bases above-mentioned; and any imaginary right line within it parallel to these edges around which the prism is capable of revolving is called the *axis of the prism.*



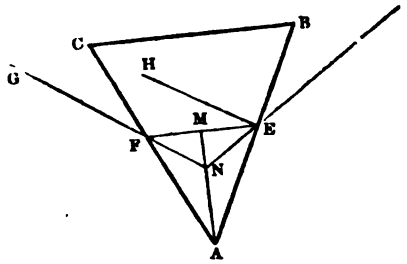
In the annexed figure the triangle B A C represents a section of the prism parallel to its basis or perpendicular to its axis. D E we shall suppose to be a ray or exceedingly narrow beam of solar light incident from *vacuo* or air on the prism at E; this ray of white light enters the prism at that point, and having undergone refraction by the dense medium of the glass, no longer proceeds as a simple ray E F, but is *dispersed* or divided into various rays of different colours over the space represented in the figure by *f* E F, and emerging at *f* F from the prism, undergoes another refraction, such that the portion *f g* of the ray proceeding from *f* is still more refracted than the portion F G from F, since the sines of the angles of incidence and refraction being in a constant ratio, that portion will be most refracted which has the greatest incidence: let now this dispersed beam *g f* F G be intercepted by a screen or wall P K, and from which extraneous light is as much as possible excluded, we shall then find the elongated space F G brilliantly painted over with tints passing gradually and insensibly from deep red to an attenuated violet, in the following order, as described by Newton, and since very generally concurred in,—red, orange, yellow, green, blue, indigo, violet. This experiment, which first opens the analysis of light, is easily made by letting a beam of light pass through a small circular hole in a shutter, in a darkened room, on a glass prism such as above described, the refracted and dispersed ray being received on the opposite wall, ceiling, or floor, according to the position of the prism. It would be still more effective by concentrating the light incident on a double convex lens in its focus, so that the beam E F may emanate more nearly from a point than it can when received through the hole of a shutter; for in the latter case rays are admitted which are inclined to each other at the angle subtended by the sun's disc to the eye. This primary experiment is, however, so familiar to almost all amateurs of science, that it will not be here necessary to enter into details respecting its most successful application.

When the image of the sun or a star, candle, &c., is thus formed by admission through a small hole or narrow line, and the refraction of the prism, the coloured space G *g*, which has the same angular breadth as the object in a direction parallel to the axis of the prism (the screen being supposed also parallel to it), but which is considerably elongated in the perpendicular direction, is called the *spectrum;* and that angle of the prism B A C the sides containing which B A, A C, have been traversed by the ray D E F G is called the *refracting* angle of the prism.

Suppose, now, that a small orifice O is made in the screen at some point of the spectrum, so that rays of any particular colour, green for example, may be transmitted through it, and let the transmitted portion be again subjected to refraction through another prism, this beam being supposed very small, to ensure its purity or near uniformity of colour. It will not, after refraction, be again decomposed, or undergo any alteration of colour, except in respect to brilliancy, arising from absorption by the second prism: thus showing that light incident on the first prism, when once decomposed into homogeneous elements by refraction, is then, at least by refraction, not further decomposable.

If the original prism B A C be turned gradually round its axis, preserving always to the incident light the same refracting angle A, the spectrum G *g* may be made to descend towards K, but after arriving at a certain point where the deviation, that is the inclination of D E produced to F G, is a minimum, it then reascends, and it is usual to make the chromatic experiments in this definite position of minimum deviation. This occurs when the position of the prism is such that the angles of incidence and emergence, or their complements D E B, G F C, are equal; for when the moving point G has reached its lowest place, it is for a moment in the condition of a fixed point like the point D, through which we may suppose the incident beam admitted; hence rays proceeding from D, notwithstanding a small variation of incidence arising from the rotation of the prism, reach G, as if it were a fixed point; and since in dioptrics it is of no consequence to the *path* in what direction we suppose the rays to move, it follows that rays proceeding from G, notwithstanding a small alteration of the angle C F G, would arrive at the fixed point or orifice D; and consequently the *data* for the determination of the angles D E B, G F C, in the position of minimum deviation, are precisely the same, and therefore these angles must then be equal.

This being premised, the following easy calculus will give the necessary angle of incidence to produce a minimum deviation



Since the angles of incidence and emergence are equal the angles formed by the interior ray E F with both sides of the prism are equal, or the triangle A E F is an isosceles; let $2a$ be the refracting angle of the prism, then drawing A M perpendicular to E F, we have $\angle$ E A M $= a$, which, being the complement of A E M, is necessarily the angle of refraction; if therefore μ be the index of refraction for rays of any given colour, the angle of incidence P, corresponding to a minimum deviation, is given by the equation,

$$\text{Sin. } (P) = \mu \text{ sin. } (a)$$

For distinctness, suppose the preceding index of refraction μ to belong to the extreme red rays, and let μ' be the index for the extreme violet rays of the spectrum; then if P' denote the angle of incidence corresponding to the minimum deviation of the latter, we have

$$\text{Sin. } P' = \mu' \text{ sin. } a;$$

and since a is always less than a right angle, and μ' is greater than μ, therefore P' is greater than P. In other words, when the red rays of the spectrum, having arrived at their lowest position on the screen, begin to reascend by the continued rotation of the prism, the violet rays will still descend a little before they arrive at their lowest position. Under these circumstances, the extent of the spectrum contracts from both ends, and an angle of incidence P'', intermediate to P and P', which do not greatly differ, corresponds to the minimum or brightest spectrum; and it would be probably useful to observe what class of rays, defined by Fraunhofer's lines, had then obtained their minimum deviation; that is, such whose index of refraction is $\frac{\sin. I}{\sin. a}$.

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* For the history of this abuse see Prynne's 'Animadversions on the Fourth Institute;' Petyt's 'Jus Parliam.', c. 7; and 'Ladies Tracts,' 327; the 'Birth, Parentage, Rise and Fall, of Nonobstante.'

We have seen that compound light, the sun's for example, may be decomposed into its homogeneous constituent rays by refraction through a transparent prism. Conversely it may be recompounded into light similar to the original, merely by making the rays, thus separated, by another refraction to occupy the same place. This may be effected by placing a prism of exactly similar material and form to that already used, with its refracting angle turned in a direction opposite to that of the former, so that the near faces of both prisms may be parallel; for the rays entering the second prism are in the same condition as if we supposed their direction inverted, that they may repass through the first; and therefore they emerge in a similar compound ray with the original, which may also be easily confirmed by experiment.

The rays issuing from the second face of the refracting prism may also be collected by means of a double convex lens, so as all to meet very nearly in its principal focus, where, if the image be received on a sheet of paper, the original compound light will be reproduced.

When the light of the sky, admitted through a small hole in a shutter in a dark room, is refracted by a prism, if an eye is placed behind the prism in the position which the spectrum would occupy on a screen, the hole will appear of the particular colour of the ray which reaches the eye, changing continually from one colour to another as the eye occupies different parts of the spectrum.

The prismatic analysis of light, together with the phenomena relative to the transmission and absorption of light, enabled Newton to conclude that the colours of natural bodies are not inherent qualities of these bodies, but depend on their powers of reflecting, transmitting, or absorbing the rays of some colours more than others from the compound light incident on them; for all bodies placed in homogeneous light of any colour appear themselves to be of that colour, though the vividness of tint is greatest when placed in that coloured light which they reflect most copiously. Hence also arise the different colours of the liquids exhibited frequently in chemists' shops, according as they are viewed by transmitted or reflected light which would necessarily be complementary colours if no absorption or extinction of light occurred in its passage through the fluid.

Many of the prismatic colours may be imitated by mixing colours taken as in the spectrum of greater and less refrangibility, as orange from red and yellow, &c., but such compound colours are not identical with the homogeneous light of the same colour, being immediately decomposable when viewed through a prism.

It would be difficult, if not altogether impracticable, to judge of the *dispersive powers* of transparent media by measuring the length of the spectra which they produce in a prismatic form, in consequence of the indefiniteness of their *termini*. The light at the violet end is so feeble that it requires some continued application of the eye to perceive a colour where we had first imagined the spectrum terminated; and, on the other hand, the influence of imagination, after we have recognised it, is apt to extend it momentarily far beyond its limits. Fortunately Nature has herself furnished a scale of definite limits in the beautiful discovery made by Wollaston and Fraunhofer of the existence of dark spaces, bands transverse to the length of the spectrum, and now generally designated Fraunhofer's lines.

These bands are best observable by forming the spectrum of a luminous line instead of a point, by means of a prism of great purity, and viewing it through a telescope of good magnifying power, though some of them may, when carefully pointed out, be recognised by the unassisted eye, and after one recognition are in future easily found. They are spaces totally deficient of light, of very unequal width, and exceedingly numerous; the large bands near the extremities of the spectrum serve, however, as definite limits, so as to furnish the requisite *criteria* for the dispersive powers of different substances; it is also very remarkable that these bands, always the same in number and relative position for the same light, are different when the source of light is varied. Thus sunlight, moon-light, planet-light, sky-light, derived from a common source, have the same lines, but they are different from those of star-light, fire light, candle-light, &c., each essentially different source having a peculiar system of deficient rays.

Substances which have not a great difference of refractive power, possess frequently very different dispersive powers, and the angular dispersion by a medium is not proportional to the angular deviation; and therefore by a system of prisms, two or more, white light incident on the first may be reproduced from the last, though on the whole refracted from its original direction. Such a system is called *achromatic*.

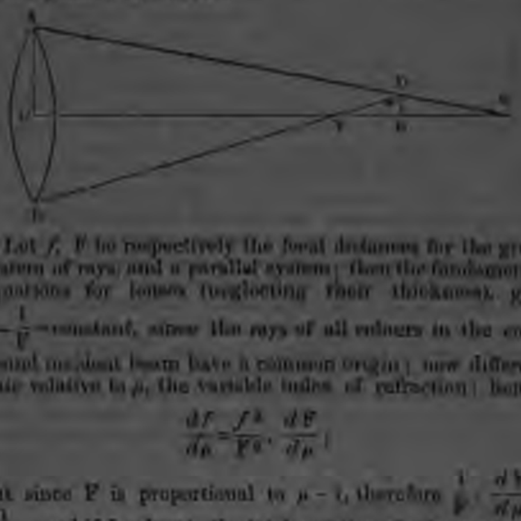
Conversely, by forming an achromatic system experimentally, where the angles of the prisms are small, and in the position of minimum deviation, if the dispersive power of the material of one of them be taken as a standard, that of the other may be readily obtained, the dispersion being measured by $\frac{\delta\mu}{\mu-1}$, μ being the index of refraction, and $\delta\mu$ the difference of its extreme values for any class of rays. This method has been much used in practice, particularly by Dollond.

The formulæ for achromaticity in systems of prisms or lenses, though not difficult of investigation, are in general too complicated and tedious for a popular work; (see *Mémoires de l'Acad. de Sciences*, 1765; *Mém. par* D'Alembert.)

The rainbow is a beautiful natural exhibition of the dispersion of light into the spectral colours. [RAINBOW.]

To find the longitudinal chromatic aberration of a lens, or the interval of the axis between the foci of extreme red and violet rays:

Let the red rays converge to the point R, and the violet to the point V in the axis.



Let f, F be respectively the focal distances for the given system of rays and a parallel system; then the fundamental equations for lenses (neglecting their thickness), give $\frac{1}{f}-\frac{1}{F}$ = *constant*, since the rays of all colours in the compound incident beam have a common origin; now differentiate relative to μ, the variable index of refraction; hence,

$$\frac{df}{d\mu}=\frac{f^2}{F^2}\cdot\frac{dF}{d\mu};$$

but since F is proportional to $\mu-1$, therefore $\frac{1}{F}\cdot\frac{dF}{d\mu}=\frac{1}{\mu-1}$; and if $\delta\mu$ denote the total variation of μ from extreme red to violet, and δf the corresponding variation of f, or longitudinal aberration, and finally h, the dispersive power of the medium, we have

$$\delta f=\frac{df}{d\mu}\cdot\delta\mu=\frac{f^2}{F}\cdot\frac{\delta\mu}{\mu-1}=h\cdot\frac{f^2}{F}.$$

To find, in the same case, the radius of the circle of least chromatic dispersion.

By referring to the same figure, we may observe that the foci R V are respectively the vertices of red and violet conical surfaces, having the lens as a common base. Let these surfaces intersect in a circle, of which the radius is D E; then it is plain that all the intermediate coloured rays pass through this circle. It is therefore that of least dispersion:

The preceding figure, representing a plane section of the whole system taken through the axis, it is obvious that, from the smallness of R V relative to C R, the angles C V B, C R A, are sensibly equal, or the triangle V R D is exceedingly nearly isosceles, and therefore D E bisects V R, or E R $=\frac{\delta f}{2}$, and D E $=$ E R $\cdot\frac{\text{C A}}{\text{C R}}=\frac{h}{2}\cdot\frac{f}{F}\cdot$ C A, and for parallel incident rays D E $=\frac{h}{2}\cdot$ C A.

DISSECTION. The art of separating the parts of organized bodies in such a manner as to display their structure.

This art is equally applicable to both divisions of the organic kingdom, and indispensable alike to the discovery of the structure of plants and animals. The grounds on which, for the well-being of the community, every facility should be afforded to the cultivation of this art, as far as regards human dissection, have been already fully stated. [Anatomy.] It is satisfactory to observe that the prejudices which formerly obstructed this practice are rapidly disappearing, and that even the most uneducated are beginning to appreciate its great importance and its signal utility.

DISSEISIN. [Seisin.]

DISSENTERS, the general name for the various Protestant religious sects in this country that disagree in doctrine, discipline, or mode of worship with the established church. The Jews and Roman Catholics are not commonly called dissenters. The origin of Protestant dissent from the church of England is usually traced back to the year [illegible], in the reign of Edward VI., when a controversy arose among the adherents of the new Reformation in consequence of the celebrated Hooper (afterwards the martyr) scrupling to be consecrated as bishop of Gloucester in the customary episcopal habit, which he deemed objectionable as a relic of Romanism. Hooper eventually received consecration without being attired in canonicals. At this time the two parties received the names of Conformists and Nonconformists. Very soon after that of Puritans came into use as the general appellation of the dissenters; and it continued to be that by which they were commonly distinguished down to the breaking out of the civil wars in the next century. The toleration of the dissenters, even in the most limited extent, dates only from the Revolution: during the century and a half that elapsed between the Reformation and that event, with the exception only of the short period of the Commonwealth, during which first the Presbyterians and afterwards the Independents had the ascendency, they continued to be persecuted by a succession of restrictive and penal laws of a more or less increasing severity. It has taken almost the entire century and a half more, that has passed since the revolution, to raise the dissenters from being a merely tolerated body to a free participation in the rights of their fellow subjects by the abolition of the Test and Corporation Acts, in [illegible]. If the relaxation of the marriage law, that has since taken place, shall be followed by the abolition of church rates, the dissenters will be placed as nearly on an equality in all respects with the adherents of the established church as it is possible that they should be, without the established church itself being abolished. In the early times of dissent the great classes of dissenters were the Presbyterians, the Independents, the Baptists, and the Quakers, and they still continue to be the most numerous sects, unless we are to reckon the Methodists, or followers of Wesley and Whitfield, some of whom are avowedly dissenters, and others not, and are also subdivided into Wesleyan Methodists, Primitive, &c. The minor sects of dissenters now make a long list; but many of them may be considered as only subdivisions of or included in the four leading denominations. From an examination of the best materials (which are however very imperfect) that exist for the statistics of dissent, Mr. Macculloch is inclined to think that the entire number of Protestant dissenters in England and Wales does not exceed 2,200,000, or, at most, 2,500,000, even including the Methodists, who may amount to about 1,200,000. (Statistical Account of the British Empire, ii., 413, 416.) But this estimate, we are inclined to think, is too low. The most numerous classes of dissenters in Scotland originated in a separation from the established church in [illegible]. They are called generally Seceders, and are divided into Burghers, Anti-Burghers, Original Burghers, and Original Seceders. There are also the body of dissenters called the Relief Church, who separated from the establishment in 1758. The only considerable body of Scottish dissenters of older standing, with the exception of the Episcopalians, are the Cameronians, or Reformed Presbyterian Synod, who are the representatives of the Covenanters of the seventeenth century. Mr. Macculloch calculates the whole number of dissenters in Scotland (exclusive of about 160,000 Roman Catholics) at about 360,000 or 380,000 persons. In Ireland, exclusive of the Roman Catholics, who now outnumber the adherents of the established church in [illegible] of 7¼ to one, the principal dissenters are the [illegible], who are mostly confined to the province of [illegible] Irish Presbyterians amount to between 600,000 [illegible] and are more than twenty times as numerous as all the other bodies of dissenters in that country taken together. (*Report of Commissioners of Religious Instruction in Ireland*, 1835.) [Doddridge.]

DISSEPIMENTS, the partitions in the inside of a fruit which are formed by the union of the sides of its constituent carpels. Dissepiments are therefore necessarily alternate with the stigma. When partitions which do not bear this relation to the stigma occur in the inside of a fruit they are called phragmata or spurious dissepiments, as in the cathartocarpus fistula where they are horizontal, and in verbena where they are vertical.

DISSONANCE, in music, a term synonymous with discord. [Discord.]

DISTANCE. The only remark which we need make upon this common word is that it is very frequently applied to *angular* distance, meaning the angle of separation which the directions of two bodies include. Thus the spectator's eye being at O, the angle A O B is the angular distance (frequently simply called the distance) of the two points A and B. In the apparent sphere of the heavens, distance always means angular distance. The term *apparent* distance is frequently applied in the same case.

DISTEMPER, an inferior kind of colouring used for both internal and external walls, but principally for the former, instead of oil colour, being a cheap substitute.

It is composed of whitening mixed with size of a coarse quality, in the proportions of twelve pounds of whitening to one of size. The size is boiled and reduced to a proper working consistency by the addition of water, after which the colour is added to form the necessary tint. Coarser colours are used for distemper than are employed in oil painting and colouring. Scene painting is executed in distemper, and paper stainers employ distemper colour in printing and staining papers for walls. The colours used in these cases are however of a better quality, and the size employed is made from the hide of the buffalo, or parchment cuttings. The proportions of size and whitening in paper staining depend on the strength of the size. In five quarts of distemper, if the size is strong, one-fourth part will be sufficient; if weak, about one-half. In mixing the size and whitening much depends on the judgment of the workman. The distemper is used in a chilled state. Five quarts will stain about eighty-four yards of paper.

DISTHENE, a variety of Kyanite.

DI'STICHOUS, a term in botany, signifies arranged in two rows, as the grains in an ear of barley, and the florets in a spikelet of quaking-grass.

DISTILLATION is a chemical process for applying a regulated heat to fluid substances in covered vessels of a peculiar form called Alembics, in order to separate their more volatile constituents in vapour: and for condensing them immediately by cold into the liquid state, in a distinct vessel, styled a *refrigerator*.

The Arabians seem to have practised, in the remotest ages, the art of extracting the aromatic essences of plants and their flowers, in the form of distilled waters, to supply the luxuries of oriental baths. They are also supposed to have been the first to extract from wine a colourless intoxicating liquor by distillation. The term alcohol, now applied to such distilled spirit, and which is supposed to be Arabic*, appears at first sight to favour that idea, but as it was antiently employed to designate merely the extremity, tenuity, or impalpable state of pulverulent substances, it affords no just ground for the above conclusion. From certain passages in Pliny and Galen there can be no doubt that the Greeks and Romans were well acquainted with the distillation of aromatic waters. Indeed Nicander, a Greek poet and physician who lived 140 years before the Christian æra, employs the terms ἄμβιξ *ambix* and distillation in describing the preparation of rose-water. From ambix, which signifies a pot, the Arabic name alambic or alembic is derived. The words *pot* and *poteen* are used in the same way by the modern Irish to designate a still and its spirituous product. It is obvious that distillation must have been a familiar process to the countrymen of Avicenna, since, in his treatise of catarrh, he compares the human body to an alembic; he regards the belly as the cucurbit or body, and the head as its capital, through which the humours distil, passing off by the nostrils as its beak.

Arnoldus de Villa Nova, a chemical physician of the thirteenth century, is the first author who speaks explicitly of an intoxicating spirit obtained by the distillation of wine, and he describes it as a recent discovery. He considers it to be the universal *panacea* so long sought after in vain. His disciple Raymond Lully of Majorca, declares this admirable essence of wine to be an emanation of the Divinity, an element newly revealed to man, but hid from antiquity because the human race were then too young to need this beverage, destined to revive the energies of modern decrepitude. He further imagined that the discovery of this *aqua vitæ*, as it was called, indicated the approaching consummation of all things—the end of the world. However much he erred as to the value of this remarkable essence, he truly foresaw its vast influence upon the condition of man, since to both civilized and uncivilized nations it has realized infinitely greater evils than were threatened in the fabled box of Pandora.

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* The true etymology of alcohol is uncertain. The Arabic word kohl, with the article al prefixed, signifies 'antimony reduced to a fine powder, and used as a collyrium for the eyes.'

In his 'Chemical Theatre,' written towards the conclusion of the thirteenth century, Raymond Lully describes the distillation of ardent spirits thus:—

'Limpid and well-flavoured red or white wine,' says he, 'is to be digested during 20 days in a close vessel by the heat of fermenting horse-dung, and to be then distilled in a sand bath with a very gentle fire. The true water of life will come over in precious drops, which, being rectified by three or four successive distillations, will afford the wonderful quintessence of wine.'

'To prove its purity,' adds he, 'if a rag be dipped in it, and kindled, it will not become moist, but consume away.'

All the older writers imagined that *aqua vitæ* imbibed from the fire its inflammable, heating, and exhilarating qualities; so in order to increase these qualities in the alcohol, they prescribed tedious and repeated warm digestions of the wine before it was put into the alembic, and an exceedingly slow distillation that each drop might come over imbued with fire.

In the present article we shall consider distillation solely in reference to the production of alcohol. The process, when applied to distilled waters, ethers, and oils, belongs to pharmacy, chemistry, perfumery, &c.

The subject naturally divides itself into two branches: 1, the formation of the alcohol; 2, its elimination from the ingredients with which it is mixed.

The only substances employed in this country in the manufacture of ardent spirits upon the great scale are different kinds of corn, such as barley, rye, wheat, oats, buckwheat, and maize. Peas and beans also have been occasionally used in small quantity. The principles in these grains from which the spirits are indirectly produced are starch and a little sweet mucilage, which, by a peculiar process called *mashing*, are converted into a species of sugar. It is the sugar so formed which is the immediate generator of alcohol, by the process of fermentation. Hermstädt estimated that two pounds of starch properly treated would yield one quart of whiskey, of specific gravity 0.9427. The following kinds of corn afford of spirits of the said strength the quantities annexed to them in the scale:

100 pounds of	wheat	.. 40 to 45	pounds of whiskey.
"	rye	. 36 to 42	"
"	barley	. 40	"
"	oats	. 36	"
"	buckwheat	40	"
"	maize	.. 40	"

We may therefore conclude, says Hermstädt, that 100 pounds of corn will yield, upon an average, 40 pounds of spirits of the above specific gravity. We shall presently see that 100 pounds or two bushels of corn produce much more alcohol in the British distilleries.

In mashing one or more kinds of corn, a greater or smaller proportion of malt is always mixed with the raw grain, and sometimes malt alone is used, as in the production of malt whiskey.

The process of malting is that incipient growth called germination, in which, by the disengagement of a portion of the carbon of the starch, in the form of carbonic acid, the ultimate vegetable elements become combined in such a proportion as to constitute a species of sugar. Malting is the most effectual method of converting starch into sugar, but it is known from the researches of Saussure, that if starch in solution be digested for some time at summer temperatures with gluten, it will undergo a remarkable change, nearly one-half being converted into a species of sugar, and one-fifth into gum. A similar change is more rapidly effected upon starch by boiling its pasty solution with one-hundredth part of its weight of sulphuric acid. The recent discovery of diastase by Persoz and Payen has enabled us to effect this curious conversion with much greater certainty, and to a greater extent than was possible by the gluten or the acid. If 8 or 10 parts of ground malt be mixed with 100 parts by weight of starch previously diffused through 400 parts of water, at 140° Fahr., and if this mixture be kept at a temperature of from 158° to 160° for three or four hours, the nearly insipid pasty liquor will become a limpid syrup, which may be evaporated by a gentle heat into an uncrystallizable sugar, capable of being used as a substitute for ordinary sugar, not only in the vinous fermentation, but in many operations of the confectioner. The same change which takes place upon pure starch in the above experiment is effected in the process of mashing as carried on in breweries and distilleries. A larger or smaller proportion of the *fecula* of the corn is thereby converted into sugar, and thus brought into a state fit for producing alcohol by fermentation.

The manufacture of whiskey or ardent spirits consists of three distinct operations: first, mashing; second, *fermentation*; third, distillation.

1. *Mashing.*—Either malt alone, or malt mixed with other grains, and coarsely ground, is put into the mash-tun, along with a proper proportion of hot water, and the mixture is subjected to agitation by a mechanical revolving apparatus, exactly similar to that employed in the breweries for the manufacture of beer. When malt alone is used, the water first run into the mash-tun among the meal has usually a temperature of 160° or 165° Fahrenheit, but when a considerable proportion of raw grain is mixed with the malt, the water is let on at a lower temperature, as from 145° to 155°, for fear of making such a pasty magma as would not allow the infusion or worts to drain readily off.

The following are the quantities of malt and raw grain mixed which have been found to afford a good product of whiskey in a well-conducted Scotch distillery:—

252	bushels of	malt,	at 40	pounds	per bushel.
948	do.	barley,	56¼	do.	do.
150	do.	oats,	47¼	do.	do.
150	do.	rye,	54¾	do.	do.
1500					

From each bushel of the above mixed meal 2⅓ gallons of proof whiskey (specific gravity 0.921) may be obtained, or 18⅔ gallons per quarter. A few distillers are skilful enough to extract 20 gallons from a quarter of that mixture. Ten imperial gallons may be considered a fair proportion of water to be introduced into the mash-tun for every bushel of meal as the first infusion. After two or three hours' agitation, the whole is left to repose for an hour and a half, and then the worts are drawn off to about one-third the volume of water employed, the rest being entangled in a pasty state among the farina. About two-thirds of the first quantity of water is now let into the tun, but at a temperature somewhat higher, and the mashing motion is renewed for nearly half an hour. A second period of infusion or repose ensues, after which these second worts are drawn off. Both infusions must be cooled as quickly as possible down to the temperature of 80° or 70° Fahr., otherwise they are apt to run into the acetous fermentation by the rapid absorption of atmospheric oxygen. This refrigeration is usually effected by exposing the wort for some time in large shallow cisterns, called coolers, placed near the top of the building, where it may be freely exposed to the aerial currents. But it is sometimes cooled by being passed through serpentine tubes surrounded with cold water, or by the agency of ventilators blowing over its surface in extensive cisterns only three or four inches deep.

After the second wort is drawn off, a third quantity of water, fully as great as the first, but nearly boiling hot, is run into the mash-tun, and well incorporated with the magma by agitation; after repose, this third wort is also drawn off, cooled, and either directly mixed with the preceding worts, or after it has been concentrated by boiling down; in most cases however it is reserved, and used instead of water for the first infusion of a fresh quantity of meal.

As a revenue of five and a half millions sterling is derived from the whiskey distilleries their operations are subjected to a very strict code of regulations, which are administered and enforced by the excise. One of these prescribes the range of specific gravity at which the worts may be lawfully let down into the fermenting tuns. The distiller must give notice to the excise officer in attendance, before commencing a *round*, whether he intends to distil from malt alone, or from a mixture of it with raw grain, and of the density he intends his worts to be when introduced into the fermenting backs. He may change this notice at the end of a month or six weeks, when, upon another notice of six days, he may change his specific gravities. In England the law restricts the distiller to the densities between 1.050 and 1.090; in Scotland, between 1.030 and 1.075, which, for brevity's sake, are called 50, 90, 30, and 75, omitting the 1.000 common to them all. At these densities the quantities of solid saccharum contained in one barrel of 36 imperial gallons, are 47.25 lbs., 85 lbs., 28 lbs., and 70.3 lbs. respectively.

The mashing and fermentation are jointly called *brewing*, and the period in which they are carried on is by law kept quite distinct from the *distilling* period, the one occupying usually one week, and the other another in rotation. About 150 gallons of wort or wash are obtained from each quarter of corn employed.

The first of the above worts will have generally the density of 1.078 when the grain is good and the mashing is well managed, and the second a density of 1.054, so that the mixture will have a specific gravity somewhat above 1.060, and will contain about 60 pounds of extract per barrel. Now, by the excise rules, 100 gallons of such wort ought to yield one gallon of proof spirit for every five degrees of attenuation which its specific gravity undergoes in the fermenting tun, so that if it falls from 1.060 to 1.000, 12 gallons of proof spirit are supposed to be generated, and must be accounted for by the distiller. If he understand his business well, he will be able to produce from 5 to 10 per cent. more than the law requires. Mr. Smith, in his examination before the Molasses Committee of the House of Commons in 1831, states that in one year, reckoning by computation from the above data, he showed produce for 60,000 or 70,000 gallons more than the presumed quantity, and paid duty accordingly; and that in 1830 he was charged for 80,000 gallons of spirits actually produced beyond the presumptive charge, according to the attenuated gravity of the worts.

In consequence of an alteration in the excise laws about twelve years ago, the distillers were allowed to ferment worts of less density than they previously could, and have been able to effect a more productive fermentation. They have been also enabled thereby to reduce the proportion of malt in the mixed meal. Formerly they were accustomed to use three parts of malt to four parts of barley, or two to three, but they soon diminished the malt to one-fifth, and latterly to one-eighth, or one-tenth, of the whole grain. One principal use of malt, besides its furnishing the saccharine ferment called diastase, is to keep the mash magma porous, and facilitate the drainage of the worts.

The cost at which whiskey may be made in England is thus stated by Mr. Smith:—When barley is 38*s.* per quarter, he reckons that one gallon of proof spirits costs 2*s.* for corn or meal, 1*s.* 2*d.* for the charge of manufacturing, 2*d.* as the duty on malt employed, and 7*s.* 6*d.* as the duty on spirit, amounting altogether to 10*s.* 10*d.* If we consider that from 18 to 20 gallons of proof spirits may be made from eight bushels or one quarter of mixed grain, we must think this statement of Mr. Smith's somewhat overcharged. Indeed good proof spirits may be bought from some distillers at a considerably less price, which proves either that they can manufacture the article more economically, or that they make a profit at the expense of the revenue.

II. *Fermentation.*

This is undoubtedly the most intricate, as it is the most important process in distillation, but unfortunately one hitherto studied with too little regard to scientific precision by the distiller. Experiments have proved that the quantity of saccharine matter converted into alcohol is dependent upon the proportion of ferment or yeast introduced into the worts; if too little be used a portion of the sugar will remain undecomposed, and if too much, the spirits will contract a disagreeable taste. In general, the worts are let down at the specific gravity of 1.050 or 1.060, and at a temperature varying from 60° to 70° Fahr., and for every 100 gallons one gallon of good porter yeast is immediately poured in and thoroughly incorporated by agitation with a stirrer. When by the attenuation the density is diminished to 1.035 one half gallon more is added, and another half gallon at the density of 1.025, after which the worts usually receive no further addition of yeast. The temperature of the fermenting mass rises soon after the introduction of the yeast 8 or 10 degrees, and sometimes more; so that it reaches in some cases the 85th or 90th degree of Fahrenheit's scale. From the appearance of the froth or scum the experienced distiller can form a tolerably correct judgment as to the progress and quality of the fermentation. The greatest elevation usually takes place within thirty-six hours after the commencement of the process. The object of the manufacturer of spirits is to push the attenuation as far as possible, which so far differs from that of the beer-brewer, who wishes always to preserve a portion of the saccharine matter undecomposed to give flavour and body to his beverage. The first appearance of fermentation shows itself by a ring of froth round the edge of the vat usually within an hour after the addition of the yeast; and in the course of five hours the extrication of carbonic acid from the particles throughout the whole body of the liquor causes frothy bubbles to cover its entire surface. The temperature meanwhile rises from 10 to 15 degrees according to circumstances. The greater the mass of liquid, the lower the temperature at which it was let down into the tun, and the colder the surrounding atmosphere, the more slowly will the phenomena of fermentation be developed under a like proportion of yeast and density of the worts. In general large vats afford a better result than small ones, on account of the equality of the process. It is reckoned good work when the specific gravity comes down to 1.000, or that of water; and a superior work when it falls 4 or 5 below it, or to 0.995.

After thirty-six hours upon the moderate scale the yeasty froth begins to subside, and when the attenuation gets more advanced, the greater part of it falls to the bottom on account of its density relatively to the subjacent fluid. In from forty-eight to sixty hours the liquor begins to grow clear, and becomes comparatively tranquil. It has been deemed advantageous towards the perfection of the fermentation to rouse up the wash occasionally with a proper stirrer, and in some cases to increase its temperature a few degrees by the transmission of steam through a serpentine pipe coiled round the sides of the vat. Some have imagined that a considerable portion of spirit is carried off by the great volume of carbonic acid evolved, and have proposed to save it by covering the vats air tight, and conducting the gas through a pipe in the lids into a vessel containing water. The economy of this apparatus is not worth the expense and trouble which it occasions. The distillers content themselves with enclosing their vats after the first violence of the action under tolerably tight covers.

Mr. Octavius Smith, the eminent distiller of Thames Bank, states in his examination before the Molasses Committee, that the acetous fermentation is always proceeding simultaneously with the vinous fermentation; for judging by the usual tests there is always a slight degree of acidity in fermenting wash; that vinegar is in fact forming along with alcohol, or that while the attenuation is increasing, acetic acid is being formed. This important fact, which agrees with our own experience, serves to show how very fallacious a test the attenuation or diminution of density is of the amount of alcohol generated and existing in a fermented wash. The acetic acid along with the undecomposed mucilaginous starch may, in fact, so far counteract the attenuating effect of the spirits as to produce a specific gravity which shall indicate 10 or 15 per cent. less spirit than is actually present in the wash. Hence the excise officers should be instructed to use test-stills in order to verify upon a small aliquot part the real quantity of distillable alcohol contained in each back of wash. After due agitation of the wash three samples should be taken by the dipping cylinder, or sinking-jar, one from the bottom, one from the middle, and one from the top; which being mixed and distilled would denote exactly the whole quantity of spirit that could possibly be extracted.

This test-still was clearly described and forcibly pressed upon the attention of the exchequer by Dr. Ure in his several examinations before the said Molasses Committee. The distillers in general, as might have been expected, scouted the idea of the possibility of ascertaining the quantity of spirits in a large back, from the distillation of a quart or a gallon of the wash; but Mr. Steel showed that by the distillation of 1000 grains in a glass retort (about one-tenth of a pint), he had obtained a produce of spirit corresponding very nearly with the result of the distillation of ten gallons of the same wash in a proper still. And Mr. C. Smith, when closely questioned, admitted that means might be devised to enable an excise officer to perform the above analytical distillation with as great precision as the scientific man who had contrived the apparatus for him. The present check, or attenuation, as it is called, which the excise apply to the fermented wash, is good for very little against a fraudulent distiller, because he can so easily introduce immediately before the visit of the officer, towards the end of the fermentation, such a quantity of salt as will so alter the density as completely to disguise and conceal seven or eight per cent. of the spirit, without in the least injuring its quality in the act of distillation. In fact, Mr. C. Smith acknowledges to its full extent the futility, or rather nullity, of that check, for he says, 'I conceive that any check which does not approximate any nearer to the fact than that just alluded to (the attenuated gravity), is almost useless, inasmuch as a distiller willing to evade the duty, could do so, as the difference between the charge of the saccharometer and the actual spirit produced, allows ample room for the most exorbitant smuggler.'* Mr. William Baker, surveying general examiner of excise, describes a mode of smuggling the spirits which would enable the distiller to make the quantity run off coincide with the quantity shown by the above fraudulent density. 'There was a pipe fastened before it came to the end of the worm, and it was carried through the wall into another part of the building.'† Any person may perceive how easy it is, with the actual distillatory apparatus, to lead a small branch tube from any point of the worm through the side or bottom of the worm-tub into a concealed subterraneous receiver.

It is curious to contrast the actual insecurity of the revenue from the distillation of whiskey with the multiplicity of precautions taken to prevent frauds; self-interest on the one hand being so much stronger and sharper than duty on the other. 'Examinations with us are constantly making; for example, we are surveyed this morning at six o'clock, the officers take their accounts and gauges, make calculations, and do a great deal of work, occupying several hours; at ten o'clock they again survey, going over the whole ground, where they continue a considerable time, frequently until the succeeding officer comes on duty: at evening too another survey takes place, similar to the former, but not by the same people; then at evening, six, the survey is repeated: at evening, ten, there comes another survey, by an officer who had not been engaged in any of the previous surveys of that day. He is not relieved until morning, six, of the day following; in addition to which, we are subject to frequent and uncertain visits of the surveyor and general surveyor; we are never out of their hands.'‡

It is computed that every 5 degrees of attenuation, as it is called, that is, every diminution of the number 5 upon the specific gravity in the third place of decimals, ought to produce 1 *per cent.* of proof spirit, or 1 gallon out of 100, as formerly stated; so that if the wort be set at 1.055, and come down to 1.000, 11 gallons of proof spirits are chargeable upon each 100 of such wash. In the fermentation of sugar worts, 1 gallon of proof spirits was calculated for every four similar degrees of attenuation. But distillation from sugar or molasses-wash is now illegal. With corn-wash, there is never more than four-fifths of the saccharine matter decomposed into alcohol and carbonic acid, in the best-managed fermentation, and frequently indeed much less. In fact, each pound of real sugar may be resolved by a successful process into half a pound of alcohol, or into about one pound of proof spirit, and hence as a solution of sugar at the density of 1·060, contains 15 per cent. by weight, or 16 per cent. by measure, which is nearly 1.7 pounds per gallon, it should yield nearly 170 pounds from 100 gallons, or 180 pound measures equal to 18 gallons of proof spirit; whereas 100 gallons of corn-wash, fermented at the above density, are computed by the excise law to yield only 12 gallons, and seldom produce more than 12 and a small fraction. There is thus therefore a wide difference between the produce of spirit from real saccharine matter as fermented by the man of science, and the produce obtained by our best malt and grain distillers. The main defect lies undoubtedly in the very imperfect saccharification of the farina of the corn in the mashing process, which, in our opinion, would require to be entirely remodelled, and conducted upon sounder and more scientific principles.

In the huge fermenting vats used by the corn distillers of this country, the fermentation goes on far more slowly than when conducted upon the moderate scale referred to in the account of this process given above. About 1 gallon of yeast is added at first for every 100 gallons of wort, and a half gallon additional upon each of the succeeding four days, making in the whole 3 per cent.; when less can be made to suffice, the spirits will be better flavoured. The fermentation goes on during from six to twelve days, according to the modifying influence of the circumstances above enumerated. After the fifth or sixth day, the tuns are covered in, so as to obstruct, in a certain degree, the discharge of the carbonic acid, as it is supposed that this gas in excess favours fermentation. The temperature is usually greatest on the fourth or fifth day, when it sometimes rises to 84° Fahr., from the starting pitch of 60° or 65°. Whenever the attenuation has reached the lowest point by the hydrometer, the wash ought to be distilled, since immediately afterwards the alcohol begins to be converted into acetic acid. This acidification may be partially repressed by the exclusion of atmospheric oxygen.

III. *Distillation.*

There is no chemical apparatus which has undergone so many metamorphoses as the still and condenser. In its simplest form it has been already represented and described. [ALEMBIC.] It may be considered to have reached its highest point of perfection, as to power and rapidity of work, in Scotland, when the distillers paid a stipulated sum per annum to the revenue for the privilege of a still of a certain size, and when therefore they derived a profit proportionable to the quantity of spirits they could run off in a given time. In the year 1799, from a report presented to the House of Commons, it appears that the Scotch distillers at that time were able to work off 80 gallons of wash in eight minutes, and the duty was levied accordingly; but very soon afterwards they contrived means of doing the same thing in about three minutes. The stills made for such rapid operation were shallow, and exposed a great surface to the fire. One of them is figured and described in Ure's 'Dictionary of Chemistry.' Since the year 1815, the whiskey duties have been levied on the quantity distilled, independent of the capacity of the still. This change has introduced a modification in the distilling apparatus, with the view of combining purity of product with economy of time. The body of the still is still comparatively flat, so as to expose a large surface to the fire; but the tapering upper part, corresponding to the capital of an alembic, is made very long, rising sometimes 15 or 20 feet before it terminates in the worm pipe or refrigeratory for condensation.

Great distilleries are usually mounted with two stills, a larger and a smaller. The former is the *wash* still, and serves to distil from the fermented worts a weak crude spirit called *low wines*; the latter is the low-wine still, and rectifies by a second process the product of the first distillation. In these successive distillations a quantity of fetid oil, derived from the corn, comes over along with the first and last portions received, and constitutes by its combination what is styled the strong and weak *faints* in the language of the distilleries. These milky faints are carefully separated from the limpid spirit by turning them as they begin to flow from the worm-end into distinct channels, which lead to separate *receivers*.

From these receivers the various qualities of spirit, low wines, and faints, are, for the purpose of redistillation, pumped up into charging backs, from which they are run in gauged quantities into the low-wine and spirit stills. The pumps afford many facilities to the fraudulent distiller for abstracting spirits without the cognizance of the excise, and thus injuring at once the fair dealer and the revenue. It would be easy to arrange a distillery so that pumps would be quite superseded, with their numerous joints and screws, and to conduct the spirituous liquids from the appropriate receivers to the chargers and stills, on successive levels, through a series of pipes, without external orifice.

One of the greatest improvements in modern distillation is the accomplishment of this essential analysis of the impure spirit at one operation. Chemistry had been long

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* Report on the use of Molasses, &c., 1831, p. 163, Q. 2794.

† Ibid. p. 179, Q. 3012.

‡ Thomas Smith, Esq., of Whitechapel-road, distiller, in Molasses Committee, p. 143, Q. [illegible]

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familiar with the pneumatic apparatus of Woulfe, without thinking of its adaptation to distillery apparatus, when Edouard Adam, an illiterate operative, after attending by accident a chemical lecture at Montpellier, where he saw that apparatus, immediately employed it for obtaining fine brandy, of any desired strength, 'at one and the same heat.' He obtained a patent for this invention in July, 1801, and soon afterwards was enabled by his success to set up in that city a magnificent distillery, which attracted the admiration of all the practical chemists of the day. In November, 1805, he obtained a certificate of improvements whereby he could extract from wine, at one process, the whole of its alcohol. Adam was so overjoyed after making his first experiments, that, like another Archimedes, he ran about the streets telling every body of the surprising results of his new invention. About the same time, Solimani, professor of chemistry at Montpellier, and Isaac Berard, distiller in the department of Gard, having contrived two distinct systems of apparatus, each most ingenious, and obtaining results little inferior to those of Adam, became in consequence formidable rivals of his fame and fortune.

Into the description of these stills, of those of Derosne, Baglioni, &c., on the continent, or of their many modifications in this country, the limits of this article do not allow us to enter. In the treatises of Lenormand and Dubrunfaut, the construction of stills is described with a minuteness of detail sufficient to satisfy the most curious inquirers. We shall content ourselves with investigating the scientific principles of a perfect spirit still, and with a delineation of its outlines.

The boiling point of alcohol varies with its strength, in conformity with the numbers in the following table.

Specific Gravity.	Boiling point by Fahrenheit's Scale.	Specific Gravity.	Boiling point by Fahrenheit's Scale.
0·7939	168·5°	0·8575	181·0
0·8034	168·0	0·8631	183·0
0·8118	168·5	0·8765	187·0
0·8194	169·0	0·8892	190·0
0·8265	172·5	0·9013	194·0
0·8332	173·5	0·9126	197·0
0·8397	175·0	0·9234	199·0
0·8458	177·0	0·9335	201·0
0·8518	179·0		

Hence the lower the temperature of the spirituous vapour which enters into the refrigerator, the stronger and purer will the condensed spirit be, because the noxious oils are less volatile than alcohol, and come over chiefly with the aqueous vapour. A perfect still should therefore consist of three parts: first, the cucurbit or boiler; second, the rectifier for intercepting the greater part of the watery particles, and the whole of the corn oil; and third, the refrigerator. Such a construction is represented in *fig.* 1, 2, and 5, in which the resources of the most refined French stills are combined with a simplicity and solidity of construction suited to the grain distilleries of the United Kingdom. Three principal objects are obtained by this arrangement: first, the extraction from fermented wort or wine, at one operation, of a spirit of any desired cleanness and strength; second, a great economy of time, labour, and fuel; third, freedom from all danger of blowing up or boiling over by mismanaged firing. When a mixture of the alcohol, water, and essential oil, in the state of vapour, is passed upwards through a series of winding passages, maintained at a regulated degree of heat, from 170° to 180°, the alcohol alone, in notable proportion, retains the elastic form, and proceeds onward into the refrigeratory tube, in which these passages terminate, while the water and the oil are in a great measure condensed and retained in these passages, so as to drop back into the body of the still, and be discharged with the effete residuum.

The system of channels shown in *fig.* 2 is so contrived as to bring the compound vapours which rise from the alembic A into intimate and extensive contact with metallic surfaces, immersed in a water-bath, and maintained at any desired temperature by a self-regulating *thermostat* or heat-governor. The neck of the alembic tapers upwards as shown at B, *fig.* 1; and at C, *fig.* 2, it enters the bottom or ingress vestibule of the rectifier C F. F is its top or egress vestibule, which communicates with the under one by parallel cases, or rectangular channels D, D, D, whose width is small compared with their length and height. These cases are open at top and bottom, where they are soldered or riveted into a general frame within the cavity, inclosed by the two covers F, C, which are secured round their edges E, E, E, with bolts and packing. Each case is occupied with a numerous series of shelves or trays, placed at small distances over each other, in a horizontal or slightly inclined position, of which a side view is given in *fig.* 3, and cross sections at D, D, D, *fig.* 2. Each shelf is turned up a little at the two edges and the one end, but sloped down at the other end, so that the liquor admitted at the top may be made to flow backwards and forwards in its descent through the system of shelves, as indicated by the spouts in *fig.* 3. The shelves of each case are framed together by two or more vertical metallic rods, which pass down through them and are fixed to each shelf. On removing the cover, the sets of shelves may be readily lifted out of the cases to be cleaned; and are hence called *moveable.*

Fig. 3.

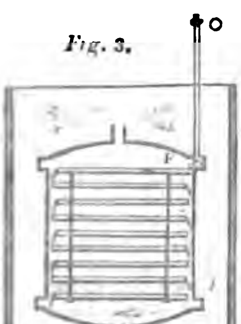


Fig. 2.

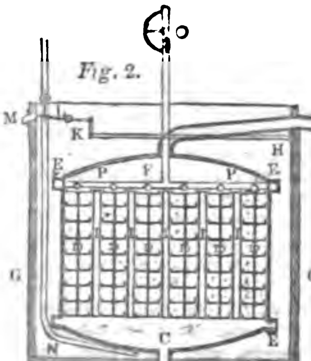


Fig. 5.

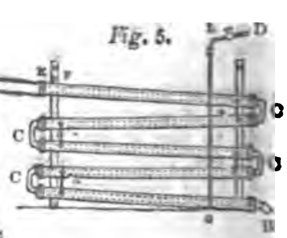


Fig. 1.

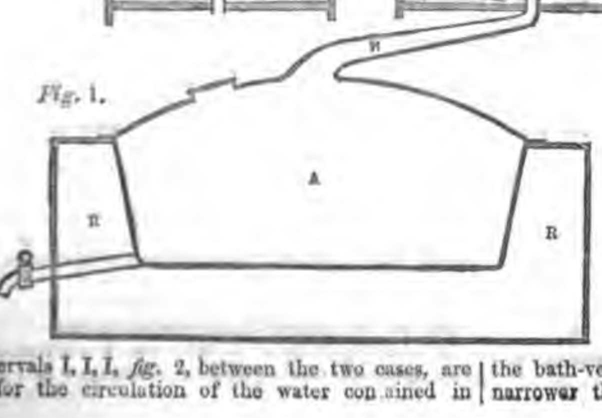
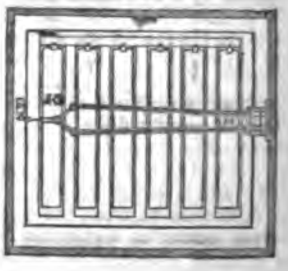


Fig. 4.



intervals I, I, I, *fig.* 2, between the two cases, are ce for the circulation of the water contained in the bath-vessel G, G; these intervals being considerably narrower than the cases. *Fig.* 4 represents in pl the surface of the rectifying cistern, shown by two different sections in *figs.* 2 and 3. H, K, *figs.* 2 and 4, is the thermostat or heat-governor, shaped somewhat like a pair of tongs. Each leg is a compound bar, consisting of a flat bar or ruler of steel, and one of zinc alloy, riveted facewise together, having their edges up and down. The links at K are joined to the free ends of these compound bars, which receding by increase of temperature, and approaching by its decrease, act through a lever upon the stop-cock L, fixed to the pipe of a cold water reservoir, and are so adjusted by a screw-nut, that whenever the water in the bath-vessel G, G rises above the desired temperature, cold water will be admitted through the stop-cock L and pipe N into the bottom of the cistern, and will displace the over-heated water by the overflow pipe M. Thus a perfect equilibrium of caloric may be maintained, and alcoholic vapour of correspondent uniformity be transmitted to the refrigeratory.

Fig. 5 is the refrigeratory, consisting of a double tube, placed in a zigzag direction, but in one plane, and supported by the two upright beams. The alcoholic vapour enters at the orifice K, and descends along the inner tube marked by dotted lines till it becomes condensed by the countercurrent of water continually ascending in the annular space between that block-tin or copper tube, and the outer cast-iron pipe F. The water of condensation enters into that annular space at the point G, being supplied by the pipe D, and the nose of the stop-cock L. The funnel into which the cold water is poured must be somewhat higher than the point K, from which that water is discharged, after having been heated to the same temperature as that of the alcoholic vapour last exposed to its influence.

When water has its particles kept by any means at rest, it becomes a very bad conductor of caloric; it acquires its maximum, conducting or cooling power, only when its particles are set in rapid and continuous motion. The present construction of worm is calculated to effect the most complete refrigeration of the vapours with the smallest expenditure of cold water, and to turn out the spirit at B in the coolest state. It has, moreover, two subsidiary recommendations, one to the distiller, and another to the revenue. Its interior may be most easily cleaned by unscrewing the bolts of the joints C C, and running sponge-rammers through the several straight pipes of which the series consists; no offset or branch pipe can be taken from it secretly, as is often practised upon the worms immersed in worm-tubs for fraudulent purposes. The number of turns in this serpentine may be increased at the pleasure of the distiller; a few only being represented in the figure for the sake of illustration. If a small portion of the overflow hot water be made to trickle down and moisten the outside surfaces of the two or three upper lengths of the serpentine, it will by evaporation produce a considerable degree of coolness, and thereby save cold water.

The preceding still apparatus is worked as follows: into the alembic put as much fermented liquor as will protect its bottom from being injured by the fire, when it is not plunged in a bath of muriate of lime, but exposed directly to the fuel. As soon as the ebullition in the alembic has raised the temperature of the water-bath G G to the desired rectifying pitch, whether 170° or 180°, the thermostatic instrument is to be adjusted by its screw-nut, and then the communication with the charging back or cistern is to be opened by moving the index of the stop-cock O over a proper portion of its quadrantal arch. The wash will now descend in a regulated stream through the pipe O F, thence spread into the horizontal tube P P, and issue from the orifices of distribution into the respective flat trays or spouts. The manner of its progress is shown for one set of trays in *fig.* 3. The direction of the stream in each shelf is evidently the reverse of that in the shelf above and below it; the turned-up end of one shelf corresponding with the discharge slope of its neighbour.

By diffusing the cool wash or wine in a thin film over such an ample range of surfaces, the constant tendency of the bath to exceed the proper limit of temperature is counteracted to the utmost without waste of time or fuel; for the wash itself *in transitu* becomes boiling hot, and experiences a powerful steam distillation. Thus also a very moderate influx of water through the thermostat stop-cock suffices to temper the bath; such an extensive vaporization of the wash producing a far more refrigerant influence than its simple heating to the boiling point. It deserves peculiar remark, that the greatest distillation with the least fuel is here effected without any pressure in the alembic; for the passages are all pervious to the vapour, whereas, in almost every wash-still heretofore contrived for similar purposes, the spirituous vapours must force their way through successive layers of liquid, the total pressure from which causes undue elevation of temperature, obstruction to the process, and forcing of the junctures. Whatever supplementary refrigeration of the vapours in their passage through the bath may be deemed proper will be administered by the heat-governor.

The bath regulated by the thermostat may however be used for obtaining fine spirits at one operation, without transmitting the wash or low wines down through its interior passages; in which case it becomes a simple rectifier. The empyreumatic taint which spirits are apt to contract from the action of the naked fire on the vegetable gluten in contact with the bottom of the still, is somewhat counteracted by the rotation of chains in the large wash-stills; but it may be entirely prevented by placing the still in a bath of strong solution of muriate of lime R R, *fig.* 1, regulated by a thermometer or, still better, a thermostat. Thus a safe and effectual temperature of from 270° to 290° Fahr. may readily be obtained. For further details, see the specification of Dr. Ure's patent still.

The quantity of proof spirit which paid duty in 1836 was twenty-seven millions of gallons, thirteen millions of which were made in Great Britain, and fourteen millions in Ireland. Of the latter, a considerable quantity was imported into this island. The manufacture of whiskey does not seem to have been diminished in this country as it has been in the United States by the influence of the temperance societies.

In 1832 .. 20,778,521 gallons paid excise duty
1834 .. 23,397,806 „
1836 .. 27,137,000 „

showing an increase which is far out of proportion with that of the population. We may add to the last quantity three millions of gallons on the score of smuggling, in licensed and illicit distilleries; making thirty millions to be the real amount of whiskey consumed by our population of twenty-four millions. [Brandy, Gin, Rum, Thermostat, Whiskey.]

DISTORTION. Deformity of the person may be advantageously classed for the purpose of discussion under two principal heads: *malformation* and *distortion*. The former is, for the most part, congenital, and is usually characterized by the deficiency or redundancy of parts, or by imperfections and irregularities of structure. The latter, arising generally after birth, comprises all permanent deviations from the natural shape or position which are effected by the influence of external or internal force in parts originally soft and flexible, or such as have acquired unnatural pliancy by accident or disease.

It is to the latter class of deformities only that our attention is for the present directed. But even thus limited, the subject is so extensive that we must once for all refer the reader for more precise information on several of its most interesting subdivisions to other professional works.

I. Every part of the body capable of independent motion is furnished with two sets of muscles, acting in contrary directions, the purpose of which is obviously to bring the part back to its place after movement in either direction. In the position of equilibrium these muscles are not in a state of absolute relaxation even during sleep; on the contrary, they continue to act with considerable energy, each exactly counterbalancing the other. This is called their tone or tension, and it is calculated to give great steadiness to the part thus held at rest between opposite forces. But if one set of the muscles should be suddenly cut across, the tension of their antagonists still remaining in action, the consequence would be a movement in obedience to the latter till the contraction had reached its limit; and the part in question would permanently retain the position into which it had thus been moved. The same effect would result if the muscle, instead of being divided, were paralyzed by the interruption of its nervous communication with the brain. Again, if the tone of one muscle were increased by spasm or otherwise, so as to give it a decided preponderance over its antagonist, the result would be similar. These considerations will sufficiently explain the nature of one large class of distortions, namely, those which result from affections of the *brain*, *muscles*, and *nerves*.

1. The simplest of these is the *drawn mouth*, or *hemiplegia*. It arises in this way: in consequence of an extravasation of blood or some other cause, the functions of one side of the brain are interrupted; the muscles of the cheek on the same side, deriving their nerves from that part of the brain, are paralysed, and the retractors of the opposite angle of the mouth being no longer balanced by an equal force, draw it up towards their origin, and retain it in that position.

2. *Strabismus*, or squinting, is frequently produced in the same way by a partial paralysis of that muscle the office of which is to turn the globe of the eye in the opposite direction, or it may arise from undue contraction of the muscle on the same side.

3. It is remarkable that *hysteria* is sometimes accompanied by a distortion of the last-mentioned kind, produced by a spasmodic contraction of the flexor muscles of one of the joints, commonly the knee or hip. For months or years this painful condition may last without mitigation: yet it may vanish all at once under the influence of some powerful impression of the body or mind. The entire loss of the voice which sometimes comes on suddenly in similar constitutions, and after long resisting every remedy, as suddenly departs, is probably an analogous affection of the muscles of the larynx.

4. *Wry neck* is a distortion also due to irregular muscular action. It generally comes on gradually in infancy, and consists in a shortened and contracted state of the *sterno-mastoid* muscle, of that side to which the head is inclined and *from* which the face is turned. *Club-foot* is often nothing more than a similar contraction of the muscles of the calf, which draw up the heel and eventually disturb the integrity of the ankle joint. This complaint also comes on at an early age, and is sometimes congenital. By proper means they both admit of relief, and often of a cure.

The list of distortions depending on a morbid condition of the muscular or nervous functions might easily be extended.

II. But by far the most common and important class of these affections is that which originates in disease of the bones.

1. The firmness and rigidity of the bones depends upon the due proportion of the earthy matter, phosphate of lime, that enters into their composition. If the proportion of this ingredient be too great, as in old age, and in the disease called *fragilitas ossium*, they become brittle, and are broken by the slightest causes; if it be too small, they become unnaturally pliant, and are distorted by the pressure of the superincumbent weight, or the contraction of the muscles.

The latter condition is prevalent with other structural changes in the disorder called *rickets*. The medical name of this complaint is *rachitis* (from ῥάχις, the spine), and was given to it by Glisson, who first described it, partly because he conceived the vertebræ to be the bones most commonly implicated; but chiefly, it would appear, from the resemblance to the English name. His doctrine was erroneous; and the error perpetuated by the misnomer has led to serious mistakes in practice as well as theory. The spine is [illegible] liable to partake with the rest of the skeleton in the morbid condition of rickets, but certainly not in a greater degree than the other bones.

This malady seldom appears within the ordinary period of [illegible]

[illegible]

formed by the incurvated spine behind the chest: the chin is thrust forward, giving an expression to the features very characteristic of the dwarf, and rests upon the breast bone, which is very prominent: on each side the ribs are flattened, and bulge in upon the lungs. The shoulders, losing the support of the wreathed and twisted clavicles, approach towards each other in front, drawing with them the scapulæ, which stick out laterally, and add considerably to the deformity as seen from behind; the arms, though bent and in reality shortened, seem of disproportionate length; the lumbar spine is thrust inwards; the pelvis is small and flattened; the thighs are bowed forward; the knees, with their patellæ at the side instead of in front of the joint, touch or overlap each other; while the feet are set wide apart, a sudden twist above the ankle still permitting the soles to be set to the ground. Such are some of the varied changes which exhibit a melancholy proof of the prevalence of the disease in every part of the bony frame, and almost defy description. Of course such extreme cases of rickety distortion are comparatively rare; yet almost daily instances are seen by those whose duty calls them into the unwholesome courts and alleys of the metropolis, and slighter examples of the affection are extremely common.

Recovery, even from considerable degrees of this affection, is more frequent and rapid than might be imagined; but the pelvis and lower limbs, which, as above mentioned, are the most commonly and extensively implicated, seldom completely regain their natural proportions. This fact, as it regards the female pelvis, is worthy of notice, being the cause of by far the most dangerous kind of difficult parturition. It is in extreme cases of this sort that the Cæsarean section has been practised.

Independently of rickety distortion, there are two other kinds of curvature of the spinal column which demand a brief notice.

The first, which has frequently been mistaken for rachitis, is usually called *lateral* curvature, to distinguish it from the more serious kind of distortion next to be considered, which is called *angular* curvature.

2. Unlike rickets, which almost always commence in infancy or early childhood, lateral curvature of the spine seldom appears before the tenth year. The external deformity consists in the prominence of one hip (generally the right), and elevation of the corresponding shoulder, the blade of which sticks out in unsightly protuberance behind. The opposite hip and shoulder are respectively flattened and depressed; and the symmetry of the chest is destroyed, one side being larger than the other, and both twisted and misshapen. On examination the spine is found to have a double curvature sideways so as to resemble the letter S, but generally turned the other way, the concavity of the lower curve being on the right, and the upper on the left side. It arises from weakness in the spinal muscles and local elongations of the ligaments of the vertebræ, from the habit of resting the weight in sitting or standing more on one side than the other; and that side is usually the right. The position is more easy than the upright one, and when not corrected by fitting exercise and change in the nature of the employment it becomes habitual, and the twist of the person permanent and increasing. The subjects of this kind of distortion are chiefly slender and delicate girls in the middle and upper classes, the poor being comparatively exempt. It comes on insidiously, the attention not being awakened by any particular derangement of the health beyond a certain degree of languor and susceptibility of fatigue, and perhaps a sluggish state of the digestion. The first symptom that betrays its presence is usually a tendency of the dress to slip off the left shoulder. It is much promoted by means often used to prevent it, such as confinement and restraint of the person and posture by stays, [illegible] high-backed chairs, reclining on a board, and other contrivances to improve the figure, and restrain the [illegible] of the [illegible], as well as by the [illegible] and [illegible] exercises of the [illegible]. Nature is not to be thwarted with [illegible]

[illegible]

different in its nature and appearance from the last described. It arises for the most part from ulceration of a scrofulous kind in the bodies of the vertebræ. The support in front being thus lost, the spine is sharply bent forwards so that one or more of the spinous processes project behind, indicating the position of the diseased vertebræ. This complaint is attended with incomplete paralysis of the lower extremities, and is not unfrequently fatal. In case of recovery the bodies of the contiguous vertebræ are approximated and consolidated with what remains of those which were diseased by the deposition of bony matter. It is in this species of spinal complaint only that rest and the recumbent posture are expedient. The observance of these essential precautions concurrently with other means frequently brings about a cure; the distortion however is permanent.

Diseases of a similar kind frequently occur in the bones and joints of other parts of the body; they require similar treatment, and are followed by analogous consolidations and distortions.

3. Rheumatism, and other disorders, and even common inflammations, occurring in a high degree within the joints or in their neighbourhood, occasionally produce like effects.

III. Distortions are sometimes occasioned by the contraction of other parts than those which are concerned in motion.

1. Such are those of the fingers which arise from chronic inflammation and permanent contraction of the palmar aponeurosis, or fascia, a strong inelastic and fibrous membrane attached to the projecting points of bone, and stretched beneath the skin of the palm for the protection of the nerves and other soft parts during the act of forcible grasping. There is a similar aponeurosis in the sole of the foot, which is subject, but not so frequently, to the same shortening. Under this division may be also classed those distortions which arise from burns and other extensive destructions and ulcerations of the skin, in consequence of the contraction of the scar in the process of healing. When these injuries take place in the front of the neck and face, the resulting deformity is sometimes frightful. The space between the chin and the breast is filled up by a tense discoloured and corrugated cicatrix, which bows the head forward and draws down the features so as to expose the inner surface of the lower eyelid and keep the mouth constantly open. When they occur in the flexures of the joints, as in front of the elbow, the cicatrix extends in the form of a hard and rigid web between the humerus and fore-arm, the joint being permanently bent. Such deformities may sometimes be partly removed by an operation; but it is extremely painful, and often unsuccessful.

2. A slight injury of the face below the eye, or the simple contraction from some other cause of the skin of that part may produce the deformity called *ectropium*, or eversion of the lower lid; and the opposite state of inversion (*entropium*, or *trichiasis*) may result from a similar contraction of the edge of the eyelid itself. Severe inflammation, and even blindness, may be the consequence of the latter affection from the friction of the lashes against the globe. Both of these deformities may be remedied by a slight operation.

IV. Another class of distortions may arise from external pressure; as of the bones and cartilages of the chest from tight stays; or of the phalanges of the toes from ill-made shoes. Instances of this kind of distortion must be familiar to all; and call for no particular explanation or remark.

DISTRESS, 'districtio,' in the jurisprudence of the Middle Ages, denotes legal compulsion generally, whether ecclesiastical or civil. One mode of compulsion extensively adopted among the nations of Teutonic origin was the taking possession of the whole or a part of the property of the offender or defaulter, and withholding it from him until the requirements of the law had been complied with. This species of distress was called 'naam,' from nyman, neiman, to take—a verb common to the Anglo-Saxon, German, and other cognate languages. The modern distress is the 'naam,' restricted to the taking of *personal chattels*; and in its most simple form it may be stated to be—the taking of personal chattels out of the possession of an alleged defaulter or wrong-doer for the purpose of compelling him, through the inconvenience resulting from the withholding of such personal chattels, to perform the act in respect of which he is a defaulter, or to make compensation for the wrong which he has committed.

Some rights to which the law annexes the remedy by distress, have been considered as too important to be left to the protection afforded by the mere detention of the *distress* (by which term the thing taken is also designated), and more efficacious means of dealing with it have been introduced; and in certain cases a sale of the property taken by way of distress is allowed, if, after a certain interval, the party distrained upon continues to be unwilling or unable to do the act required.

Distresses are either for some duty omitted, some default or nonfeasance,—or they are in respect of some wrongful act done by the distrainee.

1. *As to distresses for omissions, defaults, or nonfeasance.*—These may be grounded upon noncompliance with some judicial requirements, or they may be made by private individuals in vindication of certain rights, for the withholding of which the law has entrusted them with this remedy.

The process out of courts of record ordering such distresses to be made is called a writ of *distringas*, which, when legal proceedings were in Latin, was the word used to direct the sheriff or other officer to make the distress.

Another class of judicial distresses is where, upon refusal or omission to pay a sum in which a party is convicted upon a summary proceeding before justices of the peace, such justices are empowered to grant a warrant authorizing and directing the levying of the amount by distress and sale of the goods of the offender.

Another species of judicial distress is that awarded and issued upon a judgment recovered in an inferior court, not of record. In these cases the execution or remedy for obtaining payment of the sum recovered is by distress. A precept issues to the officer of the court, commanding him to take the goods of the party, and to impound them until he satisfies the debt. Such process issues at the command of the sheriff or of the lord of the manor, &c., in whose name and by whose authority the courts are holden.

So a distress lies, subject to certain restrictions, for fines and amercements imposed in the sheriff's tourn and in a court-leet. [LEET; TOURN.]

A penalty inflicted for the breach of a bye-law [BYE LAW] may be levied by distress, in cases where that remedy is appointed at the time of the making of the particular bye-law. But a bye-law establishing a distress cannot authorize the sale of the distress.

Another species of judicial distress is a distress taken for poor-rates. [POOR.]

In the foregoing cases the right or duty withheld has been ascertained by some judicial determination before a distress can be resorted to. But many payments and duties having their origin in feudal rights, may be enforced by distresses taken by the sole authority of the parties claiming such payments or duties. The rights, of which the vindication is thus in the first instance entrusted to the parties themselves, are connected immediately or mediately with feudal superiority; and it is observable that to feudal superiority, jurisdiction and magisterial authority were always incident.

Among the feudal duties which may be enforced by distress, at the mere will of the party claiming to be entitled to such duties, one which though seldom exacted, is still of the most extensive obligation, is fealty. Fealty is a promise confirmed by an oath, to be faithful in the performance of those engagements into which the party doing the fealty (as the act of taking the oath is termed) has expressly or impliedly entered upon becoming tenant to the party receiving the fealty.

A distress also lies for suit of court, *secta ad curiam*, or the attendance which freehold tenants owe to their lord's court-baron, or freeholders'-court, and which tenants in villenage or copyholders owe to the lord's customary court; and it is not unusual for lessees for years to covenant to attend the lord's courts, though unless they also fill the situation of freeholders of the manor, they are not qualified to sit as suitors and judges in the court baron; and unless they are copyholders they cannot be sworn upon the homage or jury in the customary court. This suit is sometimes called suit-service, to distinguish it from suit real, which is that suit of court which the resiants, or those who dwell within a hundred or a leet, owe to the sheriff's tourn or to the court-leet. [LEET; SUIT.]

A distress lies for suit of mill (secta ad molendinum), an obligation, still existing in some manors, to grind at the lord's mill.

So for frankfoldage, or a right in the lord to require his tenants to fold their sheep upon his lands.

So, if land be holden by the tenure of repairing a bridge, or a highway, or of doing suit to a leet, or filling some office

[illegible]

[illegible] property chargeable therewith, may be seized and detained [illegible]

[illegible] —Besides distresses for [illegible], this remedy is given in [illegible] for some [illegible]. Cattle or dead chattels may [illegible] the payment of a reasonable [illegible] for the injury [illegible] chattels being [illegible] of the party taking [illegible] acts of spoliation [illegible]. This is called a [illegible] being damaged.

[illegible] only to distrain [illegible] the cattle, [illegible] the injury [illegible] trespass; for otherwise he [illegible] the trespass. [illegible] Ducange, it will [illegible] on the continent [illegible] Burgundians.

[illegible] is given to all persons [illegible] interest in the soil [illegible] are therefore invaded [illegible] the occupier [illegible] persons entitled to [illegible] of the produce, as [illegible] a commoner [illegible] of a stranger [illegible] the cattle, &c. [illegible] of the soil. Nor [illegible] commoner who has [illegible] be distrained [illegible] a certain number [illegible]

[illegible] may be distrained [illegible]

[illegible]

if out of the sack, or hay not being in a barn, or corn in the sheaf, because the quantity could not be easily ascertained, and they might be scattered or injured by the removal. None of these could be taken as a distress except for damage-feasant, though the same articles when contained in bags, boxes, carts, or buildings might be distrained upon for rent. But now by 2 W. & M. sess. 1, c. 5, s. 3, distress may be made of sheaves or cocks of corn, or corn loose or in the straw, or hay lying or being in any barn or granary, or upon any hovel, stack or rick, or otherwise, upon any part of the land.

Where a stranger's cattle are found upon the tenant's land they may be distrained upon for rent-service, provided they are there by the act or default of the owner of such cattle. If they come upon the land with the knowledge of their owner, or by breaking fences which are in repair, or which neither the landlord nor the tenant is bound to repair, they are immediately distrainable; but if they come in through defect of fences which the lord or tenant is bound to repair, the lord cannot take them for rent reserved upon a lease until they have lain for a night upon the land, nor until after notice given to the owner, if he can be discovered, to remove them. But in the case of a lord not bound to repair the fences distraining for an antient rent or service, and also in the case of a rent-charge, the cattle may be taken, after they have lain a night upon the land, without notice to their owner.

Things necessary for the carrying on of trade, as tools and utensils,—or for the maintenance of tillage, as implements of husbandry, beasts of the plough, and sheep as requisite to manure the land, are privileged from distress whilst other sufficient distress can be found. But this rule does not extend to a distress for a toll or duty arising in respect of the thing taken as a distress, or of things connected with it; as a distress of two sheep for market-toll claimed in respect of the whole flock, or of the anchor of a ship for port-duty due in respect of such ship.

For the protection of tradesmen and their employers in the necessary transactions of society, property of which the distrainee has obtained the possession with a view to some service to be performed upon it by him in the way of his trade, is absolutely privileged from distress; as a horse standing in a smith's shop to be shod, or put up at an inn, or cloth sent to a tailor's shop to be made into clothes, or corn sent to a mill or market to be ground or sold. The goods of a guest at an inn are privileged from distress; but this exemption does not extend to the case of a chariot standing in the coach-house of a livery-stable keeper; nor does it protect goods on other premises belonging to the inn but at a distance from it; and even within the inn itself the exemption does not extend to the goods of a person dwelling there as a tenant rather than a guest. Goods in the hands of a factor for sale are privileged from distress; so goods consigned for sale, landed at a wharf, and placed in the wharfinger's warehouse.

Beasts of the plough may be distrained where no other distress can be found. And it is sufficient if the distrainor use diligence to find some other distress. A distress is not said to be found unless it be accessible to the party entitled to distrain, the doors of the house being open, or the gates of the fields unlocked. Beasts of the plough may be distrained upon where the only other sufficient distress consists of growing crops, which though now subjected to distress, are not, as they cannot be sold until ripe, immediately available to the landlord.

A temporary privilege from distress arises when the chattel is in actual use, as an axe with which a man is cutting wood, or a horse on which a man is riding. Implements in trade, as frames for knitting, weaving, &c., are absolutely privileged from distress whilst they are in actual use, otherwise they may be distrained upon if no other sufficient distress can be found.

By 7 Ann. c. 12, s. 3, process whereby the goods of any ambassador or other public minister of any foreign prince or state, or of their domestic servants, may be distrained, seized, or attached, is declared to be null and void. But the privilege of a domestic servant of an ambassador does not invalidate a distress for the rent, rate, or taxes of a house occupied for purposes unconnected with the service.

By 6 Geo. IV. c. 16, s. 74, no distress for rent made and levied after an act of bankruptcy upon the goods of any bankrupt shall be available for more than one year's rent accrued prior to the date of the fiat; but the party to whom the rent is due shall be allowed to come in as a creditor for the overplus of the rent due, and for which the distress shall not be available.

Where a tenancy for life or at will is determined by death or by the act of the landlord, the tenant, or his personal representatives, may reap the corn sown before such determination, and therefore such corn though sold to a third person, cannot be distrained upon for rent due from a subsequent tenant. [Emblements.]

Neither the goods of the tenant nor those of a stranger can be distrained upon for rent if they are already in the custody of the law, as if they have been taken damage-feasant, or under process of execution. But although the landlord cannot distrain, yet by 8 Ann. c. 14, he has a lien or privilege upon the goods of his tenant taken in execution for one year's rent. [Execution.]

IV. *Time of making a distress.*—Rent is not due until the last moment of the day on which it is made payable. No distress therefore can be taken for it until the following day. And as a continuing relation of landlord and tenant is necessary to support a distress for rent-service, there could at common law be no distress for rent becoming due on the last day of the term. But now, by 8 Ann. c. 14, s. 6 and 7, any persons having rent in arrear upon leases for lives, for years, or at will, may, after the determination of such lease, distrain for the arrears, provided that such distress be made within six calendar months after the determination of the lease and during the continuance of the landlord's title or interest, and the possession of the tenant from whom such arrears are due. If the possession of the tenant continue in fact, it is immaterial whether that possession be wrongful and adverse, or whether it continues by the permission of the landlord; and if a part only of the land remain in the possession of the tenant, or of any person deriving his possession from the tenant, a distress for the whole of the arrears may be taken in such part during the six months. Where a tenant is entitled by the terms of his lease, or by the custom of the country, to hold over part of the land or buildings for a period extending beyond the nominal term, the original tenancy will be considered as continuing with reference to the land, &c. so retained, and the landlord may distrain at common law for the arrears during such extended period in the lands, &c. so held over, and he may distrain under the statute during six months after such partial right of possession has entirely ceased.

When different portions of rent are in arrear the landlord may distrain for one or more of those portions, without losing his right to take a subsequent distress for the residue; so, although the first distress be for the rent last due. But if there be a sufficient distress to be found upon the premises, the landlord cannot divide a rent accruing at one time into parts, and distrain first for a part and afterwards for the residue. If however he distrain for the entire rent, but from mistaking the value of the goods takes an insufficient distress, it seems that a second distress for the deficiency will be lawful although there were sufficient goods on the premises to have answered the whole demand at the time of the first taking; and it is clear that he may take such second distress upon goods which have come upon the premises subsequently to the first taking, if in the first instance he distrain all the goods then found thereon and for the entire rent, the amount of which exceeds the value of the goods first taken.

A distress for rent or other duties or services can be taken only between sunrise and sunset; but cattle or goods found, damage-feasant may be distrained at any time of the day or night.

By the common law the remedy by distress was in general lost upon the death of the party to whom it accrued. But the king and corporations aggregate never die; and as the law authorizes a surviving joint tenant to act as if he had been originally the sole owner, he may distrain for rent or other services accruing in the lifetime of his companion.

The statutes of 32 H. VIII. c. 37, and 3 and 4 W. IV. c. 42, have extended the remedy by distress to husbands and executors in respect of rent accruing due to their deceased wives or testators. [Rent.]

No distress can be taken for more than six years' arrears of rent; nor can any rent be claimed where non-payment has been acquiesced in for twenty years, 3 and 4 W. IV. c. 27.

V. ***In what place a distress can be made.***—The remedy being given in respect of property, not of the person, a distress for rent or other service could at common law be taken only upon the land charged therewith, and out of which such rent or services were said to issue

But this restriction did not apply to the king, who might distrain upon any lands which were in the actual occupation of his tenant, either at the time of the distress or when the rent became due.

The assumption of a similar power by other lords was considered oppressive, and it was ordained by the statute of Marlbridge, that no one should make distress for any cause out of his fee, except the king and his ministers thereunto specially authorized. The privilege of distraining in all lands occupied by the party chargeable, is communicated by 22 Car. II. c. 6; 26 Geo. III. c. 87; 30 Geo. III. c. 50; and 34 Geo. III. c. 75, to the purchasers of certain crown rents.

At common law if the tenant or any other person seeing the lord or his bailiff come to distrain for rent or other service, drove the cattle away from the land holden, they might be distrained off the land. Not so when the cattle without being driven went off before they were actually taken, though the lord or bailiff saw the cattle upon the land (which for some purposes is a constructive possession). Nor if after the view the cattle were removed for any other purpose than that of preventing a distress. On the other hand, cattle of which the lord or bailiff has no view whilst they are on the land, although the tenant drove them off purposely to avoid a distress, could not be distrained.

Under 8 Ann. c. 14, and 11 Geo. II. c. 19, where a lessee fraudulently or clandestinely carries off his goods in order to prevent a distress, the landlord may within five days afterwards distrain them as if they had still continued on the demised premises; provided they have not been (*bonâ fide*) sold for a valuable consideration.

And by the 7th section of the latter statute, where any goods fraudulently and clandestinely carried away by any tenant or lessee, or any person aiding therein, shall be put in any house or other place, locked up or otherwise secured, so as to prevent such goods from being distrained for rent, the landlord or his bailiff may, in the day time, with the assistance of the constable or peace officer (and in case of a dwelling-house, oath being also first made of a reasonable ground to suspect that such goods are therein), break open and enter into such house or place, and take such goods for the arrears of rent, as he or they might have done if such goods had been put in an open field or place.

To entitle the landlord to follow the goods, the removal must have taken place after the rent became due, and for the purpose of eluding a distress. It is not however necessary that a distress should be in progress, or even contemplated. Nor need the removal be clandestine. Although the goods be removed openly, yet if goods sufficient to satisfy the arrears are not left upon the premises, and the landlord is turned over to the barren remedy by action, the removal is fraudulent and the provisions of these statutes may be resorted to. These provisions apply to the goods of the tenant only. The goods of a stranger or of an under-tenant may be removed at any time before they are actually distrained upon, and cannot be followed.

Where two closes are let by separate demises and separate rents, though such demises be made at the same time and are even contained in the same deed, a distress cannot be taken in one close for both rents.

If a rent-charge or rent-service also issue out of land which is in the hands or separate possession of two or more persons, a distress may be taken for the whole rent upon the possession of any one of them.

The lord may enter a house to distrain if the outer door be open, although there be other sufficient goods out of the house. It is not lawful to break open outer doors or gates; but if the outer door be open, an inner door may be forced. And where the lord having distrained is forcibly expelled, he may break open outer doors or gates in order to retake the distress. If a window be open, a distress within reach may be taken out at it.

At common law a distress might be taken for rent in a street or other highway being within the land demised. But now, by the statute of Marlbridge, private persons are forbidden to take distresses in the highway. This statute applies only to distresses for rent or for services and not to toll. Nor does the statute make the distress absolutely void; for though the tenant may lawfully rescue cattle distrained in the highway, or may bring his action on the case upon the statute, yet if he brings trespass or replevin, it seems it is no answer to a justification or an avowry made [illegible] of the rent.

No rent can be reserved out of an incorporeal hereditament; and therefore at common law the lord could not distrain for rent in a place in which the tenant had merely an incorporeal right—as a right of common. By 11 Geo. II. c. 19, s. 8, landlords are enabled to take a distress for rent upon cattle belonging to their tenants feeding upon any common appendant or appurtenant to the land demised. But in cases not within this enactment, the rule of the common law applies; and therefore upon a demise of a wharf and the appurtenances, with liberty to land and load goods, the landlord cannot distrain the tenant's barges lying opposite and attached to the wharf.

VI. *Mode of making a distress.*—A distress may be made either by the party himself or his agent, and as distresses in manors were commonly made by the bailiff of the manor any agent authorized to distrain is called a bailiff. The authority given to the bailiff is usually in writing, and is then called a warrant of distress; but a verbal authority and even the subsequent adoption of the act by the party in whose behalf the distress is made, is sufficient. In order that the distrainee may know what is included in the distress, an inventory of the goods should be delivered, accompanied, in the case of a distress for rent, by a notice stating the object of the distress, and informing the tenant that unless the rent and charges be paid within five days, the goods and chattels will be sold according to law. This notice is required by 2 W. & M., sess. i. c. 5, s. 2, which enacts 'that where any goods shall be distrained for rent due upon any demise, lease, or contract, and the tenant or owner of the goods shall not, within five days next after such distress taken, and notice thereof with the cause of such taking left at the chief mansion house, or other most notorious place on the premises, replevy the same, with sufficient security to be given to the sheriff,—that after such distress and notice and expiration of the five days, the person distraining shall and may, with the sheriff or under-sheriff, or with the constable of the place, cause the goods to be appraised by two sworn appraisers, and after such appraisement may sell the goods distrained towards satisfaction of the rent, and of the charges of distress, appraisement, and sale, leaving any surplus in the hands of the sheriff, under-sheriff, or constable, for the owner's use.'

At common law, goods distrained were, within a reasonable time, to be removed to and confined in an enclosure called a pound, which is either a pound covert, *i. e.* a complete enclosure, or a pound overt, an enclosure sufficiently open to enable the owner to see, and, if necessary, to feed the distress, the former being proper for goods easily removed or injured, the latter for cattle; and by 5 and 6 Will. IV. c. 59, s. 4, persons impounding cattle or animals in a common open or close pound, or in enclosed ground, are to supply them with food, &c., the value of which they may recover from the owner. By 11 Geo. II. c. 19, s. 10, goods distrained for any kind of rent may be impounded on any part of the tenant's ground, to remain there five days, at the expiration of which time they are to be sold, unless sooner replevied. The landlord is not however bound to remove the goods immediately after the expiration of the five days; he is allowed a reasonable time for selling. After the lapse of a reasonable time he is a trespasser if he retain the goods on the premises without the express assent of the tenant, which assent is generally given in writing.

The 1 and 2 Ph. & M., c. 12, requires that no distress of cattle be removed out of the hundred, except to a pound overt in the same county, not above three miles from the place where such distress is taken, and that no cattle or other goods distrained at one time be impounded in several places, whereby the owner would be obliged to sue out several replevins.

The 2 Will. & Mary, sess. 1, c. 5, s. 3, directs that corn, grain, or hay distrained be not removed, to the damage of the owner, out of the place where the same shall be found or seized, but be kept there until replevied or sold; and 11 Geo. II. c. 19, which gives a distress for rent-services upon growing crops, directs, ss. 8 and 9, that they shall be cut, gathered, and laid up, when ripe, in the barn or other proper place on such premises, or if none, then in some other barn, &c., to be procured for that purpose, and as near as may be to the premises, giving notice within one week of the place where such crops are deposited; and if the tenant, his executors, &c., at any time before the crops distrained are ripe and cut, pay or tender the rent, costs, and charges the goods distrained are to be restored. In all other cases, if the rent or other duty be paid, or performed, or tendered to be paid or performed before the distress is impounded, a subsequent detainer is unlawful, and a subsequent impounding or driving to the pound is a trespass.

The statutes authorising the sale of distresses extend only to those made for rent. At common law distresses cannot in general be either sold or used for the benefit of the party distraining. But a distress for fines and amerciaments in a court-leet, or for other purposes of public benefit, may be sold; and a special custom or prescription will warrant the sale of a distress in cases where the public has no immediate interest.

VII. *Rights and Remedies of the Distrainee.*—A distress made by a party who has no right to distrain, or made for rent or other service which the party offers to pay or perform, or made in the public highway, or upon goods privileged from distress either absolutely or temporarily, is called a *wrongful distress*. Where no right to distrain exists, or where the rent or duty is tendered at the time of the distress, the owner of the goods may rescue them or take them forcibly out of the possession of the distrainer, or bring an action of replevin, or of trespass, at his election. In replevin, the cattle or goods taken are to be redelivered to the owner upon his giving security by a replevin bond, for returning them to the distrainer, in case a return shall be awarded by the court; and therefore in this action damages are recovered only for the intermediate detention and the costs of the replevin bond. [REPLEVIN.] In the action of trespass the plaintiff recovers damages to the full value of the goods; because upon such recovery, the property in the goods is transferred to the defendant.

The 2 W. & M., sess. 1, c. 5, s. 5, provides 'That in case of any distress and sale for rent pretended to be due, where in truth no rent is due, the owner of the goods so distrained and sold may, by action of trespass or upon the case, recover double the value of such goods, with full costs of suit.'

For a wrongful distress in taking goods protected by being in a street or highway, or goods privileged from distress, the remedy is by an action on the statute, in which the plaintiff is entitled to an immediate return as in replevin.

If the cattle or goods distrained cannot be found, the sheriff may take other cattle or goods in withernam (by way of counter-distress) of the same or of a different kind, belonging to the distrainer, and deliver them to the distrainee instead of his own.

Another species of wrongful distress is *recaption*, or the taking of the same or other goods of the distrainee for the same causes pending an action of replevin, in which the legality of the first distress is questioned.

Whenever a distress is wrongful, the owner of the goods may rescue them from the distrainer; but after they are actually impounded, they are said to be in the custody of the law, and must abide the determination of the law.

Whether goods are rightfully or wrongfully distrained, to take them out of the pound is a trespass and a public offence. The proceeding by action is a more prudent course than making a rescue, even before an impounding, where any doubt exists as to the lawfulness of the distress. Independently of the danger of provoking a breach of the peace by the rescuer's thus taking the law into his own hands, he will be liable to an action for the injury sustained by the distrainer by the loss of the security of the distress, should the distress ultimately turn out to be lawful; and in such action, as well as in the action for poundbreach, the rescuer will be liable, under 2 W. & M. sess. 1, c. 5, s. 4, to the payment of treble damages and treble costs.

A distress for more rent, or greater services than are due, or where the value of the property taken is visibly disproportionate to the rent or other appreciable service, is called an *excessive distress*, for which the party aggrieved is entitled to recover compensation in an action on the case; but he cannot rescue, nor can he replevy or bring trespass.

Upon a distress rightfully taken being afterwards irregularly conducted, the subsequent irregularity at common law made the whole proceeding wrongful, and the party was said to be a 'trespasser' ab initio. But now, by 11 Geo. II., c. 19, where distress is made for rent justly due, and any irregularity or unlawful act is afterwards done by the party distraining or his agent, the distress itself is not to be deemed unlawful nor the party making it a trespasser; but the person aggrieved by such irregularity, &c., may recover satisfaction for the special damage sustained. And see Bradby on *Distresses*; Gilbert, *Distr.*; Bracton; *Fleta*; Coke upon Littleton; Bacon, Comyns, and Viner's *Abridgments*; Willes's *Reports*; 5 Nevile and Mann 600.

DITCH. [BASTION.]

DITHMARSH (DITMARSKEN, Dan.), the most westerly of the four districts of the Danish duchy of Holstein, has the German ocean for its western boundary, and Holstein Proper for its eastern, to which last it was united in 1459. On the north the Eider separates it from the duchy of Schleswig, and on the south the Elbe divides it from the Hanoverian duchy of Bremen. Its area is about 500 square miles, and its population about 47,000. It is protected against the inroads of the sea by strong dykes, is very productive in corn, pulse, linseed, &c., and rears a considerable number of cattle. Its subdivisions are the bailiwicks of North and South Dithmarsh. North Dithmarsh has thirteen parishes and four market-towns, with a population of about 22,500. The principal town is Heyde, in the heart of the bailiwick, which has a spacious market-place, a church, and public school, with about 7300 inhabitants, and is the seat of administration: the three other towns are Lunden, near the Eider, with a church and school, and about 830 inhabitants; Büsum, on the sea, with a church and harbour, and about 720 inh.; and Weslingbüren, not far from the sea, with a church and public school, and about 840 inh. Close to the latter is Schülpe, a spot well known to navigators, at the mouth of the Eider. South Dithmarsh is divided into thirteen parishes, and contains four market-towns, with a population of about 24,900. The chief town is Meldorf, at the mouth of the Miele; it is well built, and was formerly fortified, has a handsome church, a grammar-school, three other schools, public gardens, and about 2020 inhabitants. The other towns are Worden, on an arm of the sea, with a small harbour, a church, public school, and about 850 inhabitants; Brunsbüttel, on the Elbe, across which there is a royal ferry, with a church, custom-house, a public school, and about 1200 inhabitants; and Marne, with a church and public school, and about 750 inhabitants.

DITHYRAMBUS, the name of a hymn in honour of Bacchus, sung by a chorus of fifty men or boys as they danced round the blazing altar of the god: from this peculiarity it was also called the *cyclic* or *circling* chorus. The original subject of the song was the birth of Bacchus, as the name seems to have implied. (Plato, *Legg.* iii.) The music was Phrygian, and the accompaniment originally the flute. (Aristot. *Polit.* viii. 7, 9.) The Dithyrambus is particularly interesting from the circumstance that Aristotle attributes to it the origin of the Greek tragedy. 'Tragedy and comedy,' says he (*Poet.* iv. 14), 'having originated in a rude and unpremeditated manner, the first from the leaders in the Dithyrambic hymns, the other from the Phallic songs, advanced gradually to perfection.' These leaders (ἐξάρχοντες), and not as has been wrongly inferred from the words of Aristotle, the whole chorus, recited trochaic tetrameters, and are to be considered as the immediate predecessors of the actors. [DRAMA.] In the Appendix to Welcker's Treatise on the Trilogy (*Nachtrag zur Schrift über die Æschylische Trilogie*, p. 228, and following), the reader will find a learned disquisition on the Dithyrambus, deformed however by some serious errors. After the leading properties of the Dithyrambus had merged in the Greek tragedy, it became very bombastic, and in the Greek and even in modern languages the epithet Dithyrambic is a synonym for turgid and hyperbolical expressions. The etymology of the word is unknown.

DITRU'PA, a genus of Annelids, founded by the Rev. M. J. Berkeley, and which, from its having been previously confounded with the species of an entirely distinct genus (*Dentalium*), and some circumstances respecting its capture in a living state, requires particular notice.

Generic Character.—*Shell*, free, tubular, open at both ends.

Operculum fixed to a conical pedicellated cartilaginous body, thin, testaceous, concentrically striate.

Branchiæ, twenty-two in two sets, not rolled up spirally, flat, broadest at the base, feathered with a single row of cilia.

Mantle rounded behind, slightly crisped, denticulated in front, strongly puckered on either side.

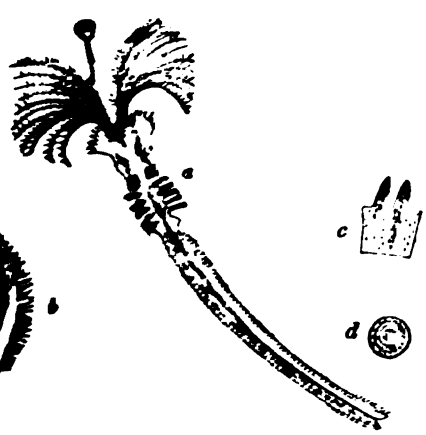
Fascicles of bristles, six on each side. (Berkeley.)

Mr. Berkeley states that a few of the specimens of sand, gravel, &c. from different parts of the great bank running parallel with the north-west coast of Ireland, obtained by Captain A. Vidal, R.N., during the extensive soundings made by that officer in the summer of 1830, whilst in search of Aitkin's Rock, were placed in his hands, when he found among them several specimens of the shell of a testaceous animal, which proved to be the *Dentalium subulatum* of Deshayes, and identical with the Madeira specimens, the only points of difference being a paler hue, and an almost total absence of the construction near the orifice, the former being, as Mr. Berkeley observes, exactly such as might be expected from the occurrence of the species in a higher latitude, and the latter so variable as not to throw any doubt on its specific identity. Having previously been convinced, from Mr. Lowe's specimen, that the animal was not a *Dentalium*, but an *Annelid*, Mr. Berkeley requested Captain Vidal to preserve in spirit during the following summer, when operations on the bank were to be resumed, whatever animals he should procure alive in sounding, and, if possible, specimens of the so-called *Dentalium*, at the same time noting the depth at which they were taken. The result was the capture of the shell with the included animal, which enabled Mr. Berkeley to establish the genus named at the head of this article. The animals of the Madeira and British specimens proved to be perfectly identical.

Habits, depth, &c.—It appears from Mr. Berkeley's paper, that the shells first handed to him by Captain Vidal occurred in fine sand, at various distances from the coast, in lat. 55°, at great depths—from 60 to 120 fathoms. After speaking of the animals preserved in spirit, and stating that Captain Vidal noted the depth at which each specimen was taken, Mr. Berkeley remarks that the so-called *Dentalium* did not occur at any less depth than 63½ fathoms, and twice (on one occasion off St. Kilda) it occurred at 171 fathoms. Nothing could be concluded as to habit, from the manner in which the shells were imbedded in the tallow (with which the lead was armed); but this was of the less consequence, says Mr. Berkeley, because it had appeared, from Mr. Lowe's information, that the animals are found in great numbers together, in masses of a conglomerate (if it may be so called) of mud and various marine substances, the broader end only appearing above the surface. Mr. Berkeley infers, from the great difference in the diameter, that the narrow or posterior end is gradually absorbed in the course of growth.

Geographical Distribution.—Madeira, British seas, and probably a much more extensive range.

Place in the Animal Series.—Mr. Berkeley is of opinion that, notwithstanding the resemblance of the shell to that of true *Dentalia*, it is most nearly allied to *Serpula*; but evidently distinct, in having an unattached shell (for there is no evidence to lead to a suspicion that it is attached, even in infancy), and especially in possessing a posterior as well as anterior aperture. He thinks that other species of so-called *Dentalia* may be found to belong to the genus *Ditrupa*. One at least, he observes, does so belong, viz., *Dentalium Gadus*, Mont. (*Dent. coarctatum*, Lam.). Mr. Berkeley thinks it highly probable that the other minute British *Dentalia* will prove to possess an animal of like structure, though possibly, even in that case, it would be requisite to place them in a distinct genus.



Ditrupa subulata, magnified.

a, b, one of the branchiæ; c, a portion of the anterior part of operculum. (Zool. Journ. vol. v.)

Example. *Ditrupa subulata*, Berkeley; *Dentalium subulatum*, Deshayes.

DITTANY OF CRETE, the common name of the well-known labiate plant called Origanum Dictamnus or Amaracus Dictamnus.

DITTON, HUMPHREY, an eminent divine and mathematician, was born at Salisbury, May 29, 1675. He was an only son; and manifesting good abilities for learning, his father procured for him an excellent private education. It does not appear that he was ever at either of the universities, a circumstance owing, probably, to the religious principles of his parents. Contrary, it is understood, to his own inclination, but in conformity with his father's wishes, he chose the profession of theology; and he held a Dissenting pulpit for several years at Tunbridge with great credit and usefulness.

His constitution being delicate, and the restraints of his father's authority being removed—he also having married at Tunbridge—he began to think of turning his talents into another channel. His mathematical attainments having gained for him the friendship of Mr. Whiston and Dr. Harris, they made him known to Sir Isaac Newton, by whom he was greatly esteemed, and by whose recommendation and influence he was elected mathematical master at Christ's Hospital. This office he held during the rest of his life, which, however, was but short, as he died in 1715, in the 40th year of his age.

Ditton was highly esteemed amongst his friends: and great expectations were entertained that he would have proved one of the most eminent men of his time. He however attained a high degree of celebrity, and published several works and papers of considerable value, of which the following list contains the principal.

1. On the Tangents of Curves, &c., 'Phil. Trans.,' vol. 23.
2. A Treatise on Spherical Catoptrics, in the 'Phil. Trans.' for 1705; from whence it was copied and reprinted in the 'Acta Eruditorum,' 1707.
3. General Laws of Nature and Motion, 8vo. 1705. Wolfius mentions this work, and says that it illustrates and renders easy the writings of Galileo, Huygens, and the 'Principia' of Newton.
4. An Institution of Fluxions, containing the first Principles, Operations, and Applications of that admirable Method, as invented by Sir Isaac Newton, 8vo. 1706.
5. In 1709 he published the 'Synopsis Algebraica' of John Alexander, with many additions and corrections.
6. His 'Treatise on Perspective' was published in 1712. In this work he explained the principles of that art mathematically; and besides teaching the methods then generally practised, gave the first hints of the new method, afterwards enlarged upon and improved by Dr. Brook Taylor, and which was published in the year 1715.
7. In 1714 Mr. Ditton published several pieces, both theological and mathematical, particularly his 'Discourse on the Resurrection of Jesus Christ' and the 'New Law of Fluids, or a Discourse concerning the Ascent of Liquids, in exact Geometrical Figures, between two nearly contiguous Surfaces.' To this was annexed a tract to demonstrate the impossibility of thinking or perception being the result of any combination of the parts of matter and motion: a subject which was much agitated about that time. To this work was also added an advertisement from him and Mr Whiston concerning a method for discovering the longitude, which it seems they had published about half a year before. This attempt probably cost our author his life; for though it was approved and countenanced by Sir Isaac Newton before it was presented to the Board of Longitude, and the method has since been successfully put in practice in finding the longitude between Paris and Vienna, yet that board determined against it. The disappointment, together with some ridicule (particularly in some verses written by Dean Swift), so far affected his health, that he died in the ensuing year, 1715

In the account of Mr. Ditton, prefixed to the German translation of his discourse on the Resurrection, it is said that he had published, in his own name only, another method for finding the longitude; but this Mr. Whiston denied. However, Raphael Levi, a learned Jew, who had studied under Leibnitz, informed the German editor that he well knew that Ditton and Leibnitz had made a delineation of a machine which he had invented for that purpose, that it was a piece of mechanism constructed with many wheels like a lock, and that Leibnitz highly approved of it for land use, but doubted whether it would answer on shipboard, on account of the motion of the ship.

DIURETICS are agents which augment the urinary secretion and facilitate its expulsion from the bladder. They constitute an extensive class of substances which, however, are very uncertain in their action, and require to be varied very frequently on account of the effects which their long continued use produces on the stomach and digestive function. The uncertainty of their operation is owing probably less to causes inherent in them than to our want of acquaintance with or attention to the circumstances which influence their action. Some writers disavow their belief in the existence of a distinct class of substances entitled to be called diuretics, considering them as mere general stimulants; but such a view is inadmissible, as many of them, far from being stimulants, are decidedly sedative, while some of the feelings which cause diuresis, such as fear or terror, and the external application of cold, are likewise sedative in their effects on the system.

In attempting to ascertain or account for their mode of action, we must constantly bear in mind the nature of the functions of the kidneys, viz., not only to remove from the body a considerable quantity of its fluid contents, but at the same time a great number of saline and other principles, the retention of which, for any considerable time, in the system, causes serious departure from its healthy state, and in some instances speedy death. Not only therefore must the quantity of fluid eliminated be in due proportion, but the quality or chemical constitution of it must also be of a proper kind. Any variation in these conditions requires the interference of medicine to rectify it. In endeavouring to accomplish this object, it must be borne in mind that, according to the state of the system, sometimes an acid diathesis predominates, sometimes an alkaline. The means which we employ to attain our object may be classified according to their primary modes of action on the system. Some are stimulant, such as gamboge, cytisus scoparius, alcohol, spiritus ætheris nitrici, oil of juniper, oil of turpentine, &c. Some, again, are sedative, such as lactuca virosa, leontodon taraxacum, digitalis, squil, colchicum, &c.: others are refrigerant, of which some render the urine acid, such as the dilute mineral acids; some, on the opposite hand, render the urine alkaline, such as the carbonate of potass, acetate, tartrate and bitartrate of potass; while certain saline diuretics do not render it either acid or alkaline, such as nitrate of potass, bichlorate of soda, &c.

The more acrid diuretics seem to act upon the lower sphere of life, or what may be considered the vegetative system, such as the cellular tissue, the fatty structures, and the internal mucous coats, the secretion of which they render thinner as well as more abundant, but at the same time they interfere much with the assimilative process as well as with that of digestion, even when given in small doses; and hence arises the impossibility of prolonging their employment beyond a very limited time. Whatever be the agent we select it is by no means necessary that, to cause a diuretic effect, the substance should be decomposed; but it is important to remember that, when saline diuretics are decomposed, the alkali is carried to the kidneys as the emunctory by which it is to be ejected from the system, and hence their use speedily renders the urine alkaline, which, when in a high degree, may prove very hurtful to the system generally, and to the bladder and urinary passages in particular.

Numerous as are the agents termed diuretics, none of them will act as such unless the patient be under certain conditions. If a very inflammatory state of the system exist, no article will act as a diuretic till this be lessened, and hence the necessity of employing venesection and saline cathartics before administering any of the class of diuretics; and under such circumstances colchicum is perhaps the best to begin with. Even such inflammation as exists in some forms of dropsy must be removed by antiphlogistic means before diuretics will have a beneficial effect. (Blackwall *on Dropsy*.)

When a very great quantity of fluid is present in the body, some of it must be carried off by other means before diuretics can act, as the absorbents under such circumstances do not furnish a supply to the kidneys—the activity of absorption being always in an averse ratio to the smallness of the quantity of fluid present. (Majendie.) If there be great general debility of the system, and particularly of the absorbents, this state must be obviated either by the exhibition of tonics previous to or along with the diuretic remedies. Lastly, none of the saline diuretics, which are susceptible of decomposition, will act, if any considerable catharsis be going on, and hence that action, if arising from other causes, should be moderated or checked; and care should be taken not to exhibit such of them as are also purgatives in such doses as to act upon the bowels. This observation is not intended to prohibit the exhibition of a single purgative previous to commencing the use of diuretics, as this is often beneficial, or to forbid their occasional use when required to obviate particular symptoms. It must never be forgotten that if the patient be kept very warm, the action will more probably be directed to the skin than to the kidneys; hence the patient should not, if possible, remain in bed; the medicines should be given during the day, and the air of the apartment should be cool, and the clothing light. Indeed cold itself is a powerful diuretic, and sometimes succeeds where every other fails. The drinking of diluents likewise promotes the action of the kidneys: it is therefore unwise as well as cruel to withhold water from dropsical patients. [DILUENTS.]

DIVAN. [DÍWÁN.]

DIVERGENCY, DIVERGENT. [CONVERGENT.]

DIVERS, COLY'MBIDÆ, a family of swimming birds (Natatores), having a smooth, straight, compressed, and pointed bill.

Willughby assigned the family a place in his fifth section ('whole-footed birds, with shorter legs'),* under the name of '*Douckers* or *Loons*, called in Latine *Colymbi*,' and he divided them into 'cloven-footed *Douckers* that have no tails,' the Grebes, and the 'whole-footed Douckers with tails,' the true Divers. The following is Willughby's description 'of *Douckers* in general.' 'Douckers have narrow, straight, sharp-pointed bills, small heads, and also small wings; their legs situate backwards, near the tail, for quick swimming and easier diving; broad flat legs, by which note they are distinguished from all other kinds of birds; broad claws, like human nails. Of these Douckers there are two kinds; the first is of such as are cloven-footed, but fin-toed, having lateral membranes all along the sides of their toes, and that want the tail: the second is of those that are whole-footed and caudate, which do nearly approach to those birds we call *Tridactylæ*, that want the back toe. These are not without good reason called *Douckers*, for that they dive much, and continue long under water, as soon as they are up dropping down again.'

Ray, in his 'Synopsis,' arranges the cloven-footed and whole-footed *Colymbi*, *Grebes*, and *Divers*, under his 'Palmipedes tetradactylæ digito postico soluto, et primò rostro recto angusto acuto, brachypteræ et Urinatrices, *Colymbi* dictæ.' He also includes the genus *Mergulus*. [AUK.]

Linnæus placed both the *Divers*, properly so-called, and the *Grebes* under his genus *Colymbus*, which stands in his system under the order *Anseres*, between the genera *Phaëton* (tropic birds) and *Larus* (gulls).

Pennant followed Brisson in separating the *Grebes* from the *Divers*. The first he placed next to the *Coots*, and immediately before the *Avosets*; and the *Divers* between the *Guillemots* and the *Gulls*.

Under the term '*Plongeurs ou Brachyptères*,' Cuvier arranges those *Palmipèdes*, 'a part of which have some relation to the *Water-hens*. The legs placed more backward than in any of the other birds, render walking a difficult operation, and oblige them, when on land, to keep themselves in a vertical position. As the greater part of them are, besides, bad fliers, inasmuch as some of them cannot fly at all on account of the shortness of their wings, they may be regarded as almost exclusively attached to the surface of the waters. In accordance with this destination their plumage is more close-set, and sometimes it even offers a smooth surface and silvery hue. They swim under the water, aiding themselves with their wings, nearly as if they were fins. Their gizzard is sufficiently muscular, their *cæca* are moderate, and they have each a peculiar muscle on each side of their lower larynx.' The following are the genera comprehended under this family by Cuvier:—the *Grebes*, Brisson; (*Podiceps*, Latham; *Colymbus*, Brisson and Illiger). The *Divers* (*Plongeons*), properly so-called (*Mergus*, Brisson; *Colymbus*, Latham; *Eudytes*, Illiger). The *Guillemots* (*Uria*, Brisson and Illiger). The *Auks* (*Pingouins*), *Alca* of Linnæus. The *Penguins* (*Man-*

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* Willughby observes, 'Under the name of *whole* or *web-footed* we comprise some birds which have indeed their toes divided, but membranes appendant on each side: such are some of the Divers or *Loons*. These might more properly be denominated *fin-toed*, or *fin-footed*, than *whole-footed*.

chots), *Aptenodytes* of Forster, consisting of the subgenera *Aptenodytes*, Cuvier; *Catarrhactes*, Brisson; and *Spheniscus*, Brisson.

Temminck places the *Grebes* (*Podiceps*) next to the *Phalaropes*, at the end of his fourteenth order, the *Pinnatipedes*, or fin-footed birds; and the *Divers* (*Colymbus*, Latham), between the *Pelicans* and the *Guillemots* in his fifteenth order, the *Palmipèdes*.

Mr. Vigors makes his fifth order of birds (Natatores) comprise the following families—

Anatidæ, Leach.
Colymbidæ, Leach.
Alcadæ,
Pelecanidæ, Leach.
Laridæ, Leach.

Or, with reference to the typical groups—

Normal group.

With short wings, which are sparingly feathered, and with feet placed behind the equipoise of the body . . . } *Colymbidæ*. *Alcadæ*.

Aberrant group.

With longer and well-feathered wings, and feet especially placed within the equipoise of the body . . . . } *Pelecanidæ*. *Laridæ*. *Anatidæ*

He considers the genus *Mergus*, of Linnæus, the species of which carry the powers of swimming and diving to the greatest extent, making use of their wings also in their progress through the water, and, at the same time, exhibiting a constrained and embarrassed mode of walking, in consequence of the backward position of the legs, as forming the passage from the *Anatidæ* to the *Colymbidæ*. 'The distinctively marked character,' writes Mr. Vigors, in his paper 'on the natural affinities that connect the orders and families of birds'* 'of the lobated hind toe, which prevails among the latter groups of the family we have just quitted, conducts us to *Podiceps*, Latham, that commences the family of *Colymbidæ*, where the same character is strongly developed. The difference between the bills of the types of these two families is softened down by the intervention of that of *Mergus*, which is intermediate between the broad and depressed bill of *Anas* and the narrow and sharp-pointed bill of *Podiceps*. This last genus, in conjunction with *Colymbus*, Linn., from which it differs chiefly in the construction of the foot, composes the family of the *Colymbidæ*. These two well-known groups, differing but little among themselves in external characters, form one of those normal groups of the order where a deficiency is exhibited in the powers of flight by the shortness of their wings, and in the faculty of walking by the backward position of their legs. These deficiencies in the groups before us are compensated for by their capability of remaining for a length of time under water, and by their superior powers of diving. For this latter purpose the structure both of their wings and legs is admirably adapted; the former by their strength assisting them as oars under water, and by their brevity not interfering with their progress; the latter by their compressed and sharpened edge offering no resistance to the water as they are drawn up to effect the stroke which accelerates the movements of the bird. From their superiority in these characters and powers, the birds themselves have obtained *par excellence* the name of *Divers*. In these particulars we may observe them to be united with the *Alcadæ* which succeed them, and from which they are chiefly separated by the presence of the hind toe, consequently less developed in the family to which we now proceed.' Mr. Vigors then goes on to the Auks (*Alcadæ*), which he enters by means of the genus *Uria* [Guillemot], originally included in the *Colymbus* of Linnæus, and from which it has been separated chiefly on account of the tridactyle conformation of its foot. This character distinguishes the greater part of the Alcadæ, a family which, in addition to *Uria* and *Alca*, contains, according to Mr. Vigors, the genus *Aptenodytes* of Linnæus.

M. Lesson, in his Manual, makes the *Colymbidæ* (*Plongeurs* or *Brachyptères*, Cuv., *Urinatores*, Vieillot), the first family of the sixth order of birds, *Les Palmipèdes*, *Natatores* of Illiger and Vieillot; and the family comprises the genera *Podiceps*, Lath., *Colymbus* (part), Linn., and *Cepphus*, Pall.

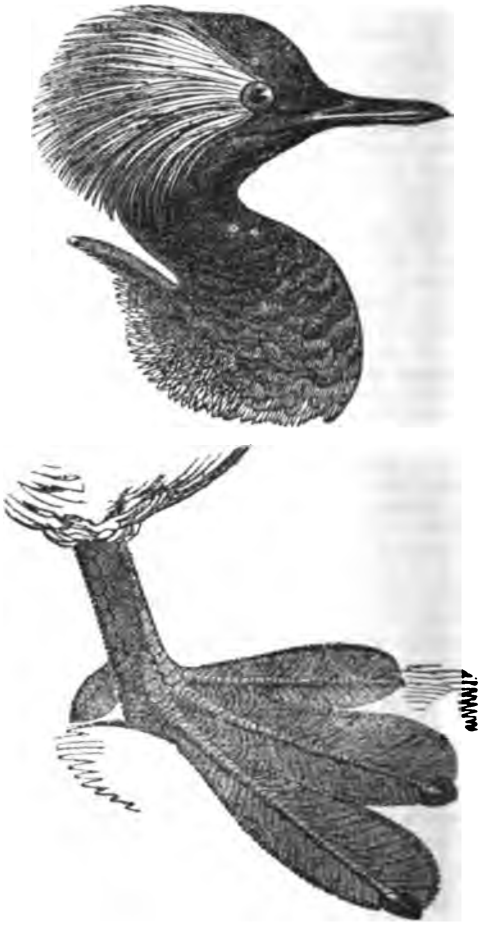
The Prince of Musignano (Charles Lucian Bonaparte) places *Podiceps* under his order Anseres in the family *Lobipedes*, and *Colymbus* under the same order in his family *Pygopodes*.

In 'Fauna Boreali-Americana,' *Podiceps* is placed at the head of the order *Natatores*, and is immediately succeeded by *Sterna* (the Terns): the position of *Colymbus* is between *Pelecanus* and *Uria*, which last-mentioned genus concludes the order.

Colymbidæ.

Genera. Podiceps.

Bill longer than the head, robust, slightly compressed, or nearly cylindrical, subulated, straight, entire, pointed: *upper mandible* straight, or hooked at the point; *nostrils* oblong, half-closed. *Wings* short, the three first *quills* of equal length and longest. *Tail* none. Toes bordered with large fimbriations; *hallux* pinnated.



Head and foot of the male Eared Grebe; summer plumage; the head from Mr. Gould's British birds, the foot from a specimen in the Museum of the Zoological Society.

Habits, &c. The Grebes haunt the sea as well as the rivers, are excellent swimmers, and dive frequently, as all who have watched the Dabchick or Little Grebe (Podiceps minor), and have been amused by its quickly-repeated plungings well know. They feed on small fishes, frogs, crustaceans, and insects, and their nests, formed of a large quantity of grass, &c., are generally placed among reeds and *carices*, and rise and fall with the water.

Geographical distribution. Very wide. Five European species are enumerated, and the foreign species are very numerous. The form seems capable of adaptation to great varieties of climate. In the 'Tables' published in the 'Introduction to Fauna Boreali-Americana,' we find *Podiceps cornutus* and *Podiceps Carolinensis* among the birds which merely winter in Pennsylvania, and migrate in summer to rear their young in the Fur Countries; and *Podiceps cristatus*, *P. rubricollis*, and *P. cornutus* in the list of species common to the Old World and to the Fur Countries. Mr. Sabine gives a description of a mature individual of *Podiceps rubricollis* killed at Great Slave Lake, and of a specimen of *Podiceps Carolinensis* killed at the same place, both in Sir John Franklin's first expedition, and in May, 1822; and

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* 'Linn. Trans.,' vol. xiv., p. [illegible]

Dr. Richardson notes *Podiceps cristatus* as having been killed on the Saskatchewan, and *Podiceps cornutus* at Great Slave Lake ('Fauna Boreali-Americana'). *Podiceps Chilensis* and *Podiceps dominicanus* are natives of the warm parts of America; the first, as its name implies, having been found in the bay of Concepcion and the second on the Brazilian waters (Rio Grande and S. Paulo); and we select, as an example, *Podiceps occipitalis* of Lesson, from the rivers of the Malouin Islands (Isles Malouines).

Description. This Grebe, according to M. Lesson, is remarkable for the delicate tints of its plumage, which is slate-grey (*gris ardoisé*) above and of a satiny white below. The cheeks and forehead are of a light grey; a bundle of loose plumes (*plumes effilées*) springs behind each eye, and is prolonged backwards and on the sides of the neck. A *calotte* of deep black rises from the occiput, and is prolonged on the posterior part of the neck half way down it. The throat is of a pearled grey, which becomes lighter, so that the front of the neck and the sides are of a pure white, as well as the rest of the lower part of the body. The back and wings are of a deeper slate-colour, and this tint, mingled however with white, prevails on the feathers of the rump. The tarsi, toes, and the considerably large membranes which fringe them, are greenish. The bill is short and black. The iris is of a most lively red, so brilliant as to call forth from Père Dom Pernetty, whose *Petit Plongeon à Lunettes* it is, the expression that 'diamonds and rubies have nothing to offer equal to the fire of the eyes of a species of Plongeon which is frequently found on the edge of the sea.' The total length of this Grebe is eleven inches and two or three lines; from the forehead to the point of the bill, eight lines; tarsi, seventeen lines; external toe, two inches.

The form of the bird is so well known from the common Dabchick, that it would have been superfluous to give a figure of an entire Grebe.

Colymbus (*Mergus*, Brisson—*Urinator*, Lacépède—and *Eudytes*, Illiger).

Bill moderate, strong, straight, very much pointed, compressed; *nostrils* concave, half closed. *Wings* short; the first *quill* longest. *Tail* short, rounded. Three front *toes* very long, entirely palmated; *hind toe* bordered with a small supple membrane.

Habits, &c. The Divers bear a close resemblance to the Grebes, from which they differ but little, excepting in their palmated feet. On the water they are at their ease: on land they, as well as the Grebes, are awkward and beset with difficulties in their locomotion.

Geographical distribution. Principally the northern latitudes, where they nestle in the wildest and most desert spots. In the tables in 'Fauna Boreali-Americana,' we find *Colymbus glacialis* and *C. septentrionalis* in the list of species which merely winter in Pennsylvania, and migrate in summer to rear their young in the Fur Countries, and *Colymbus septentrionalis* in the list of birds (migratory) detected on the North Georgian Islands and adjoining seas, lat. 73° to 75° north, on Sir Edward Parry's first voyage. *Colymbus glacialis* and *C. septentrionalis* occur in Captain Sabine's list of Greenland Birds and *Colymbi glacialis, arcticus*, and *septentrionalis*, in Dr. Richardson's list of species common to the Old World and to the Fur Countries.

Example, *Colymbus glacialis*.

Description of a specimen killed on Great Bear Lake.—*Colour.* Head, neck, and upper tail-coverts, glossed with deep purplish green, on a black ground. A short transverse bar on the throat, a collar on the middle of the neck, interrupted above and below, and the shoulders white, broadly striped on the shafts with black. Whole *upper plumage*, wings, sides of the breast, flanks, and under tail-coverts, black; all, except the quills and tail, marked with a pair of white spots near the tip of each feather; the spots form rows, and are large and quadrangular on the scapulars and interscapulars, round and smaller elsewhere, smallest on the rump. *Under plumage* and inner wing-coverts white, the axillaries striped down their middles with black. *Irides* brown.

Form. Bill compressed, strong, tapering; its rictus quite straight; its contour very slightly arched above; lower mandible channelled beneath, appearing deepest in the middle; its gonys sloping upwards to the point; margins of both mandibles, but particularly of the lower one, inflected. *Inner wing-coverts* very long. *Tail*, of twenty feathers, much rounded. Total length thirty-six inches; extent of wing forty-eight inches. Dr. Richardson, whose description this is, observes, that specimens in mature plumage vary considerably in total length, upwards of an inch in length of wing, and more than half an inch in the length of the tarsus.

Young of the year. Temminck remarks, that these differ considerably from the old birds. The head of the young, the occiput, and the whole posterior part of the neck are of an ashy brown; on the cheeks are small ashy and white points; throat, front of the neck, and other lower parts pure white; feathers of the back, of the wings, of the rump and flanks, of a very deep brown in the middle, bordered and terminated by bluish ash; upper mandible ashy grey, lower mandible whitish; iris brown; feet externally deep brown, internally, as well as the membranes, whitish. In this state Temminck says that the bird is the *Colymbus Immer*, (Gmel. Syst. Lath. Ind.); *Le Grand Plongeon* of Buffon, (but the plate enl. 914 represents a young individual of *Colymbus Arcticus*); *Mergo Maggiore o Smergo*, (Stor. deg. ucc.,) with a good figure. He thinks that the *Imber Taucher* of Bechstein (Naturg. Deut.) is probably a young of this species on account of its large dimensions; and remarks that under the name of *Colymbus Immer* the young of this species are often confounded with those of *Colymbus Arcticus*.

At the age of a year, according to the same author, the individuals of both sexes show a transverse blackish brown band towards the middle of the neck, about an inch in length, forming a kind of collar; the feathers of the back become of a blackish tint, and the small white blotches begin to appear. In this state it is the *Grand Plongeon* of Brisson, (vol. vi., p. 105, pl. 10, f. 1,) a very exact figure.

At the age of two years the collar is more defined; this part, the head and the neck, are varied with brown and greenish-black feathers; the numerous blotches on the back and wings become more prevalent, and the band under the throat, and the nuchal collar also, are marked with longitudinal brown and white lines.

At the age of three years the plumage is perfect.

According to Montagu, *Colymbus glacialis* is the *Colymbus maximus caudatus* of Ray; *Mergus major nævius* and *Mergus nævius* of Brisson; *L'Imbrim* of Buffon; *Greatest speckled Diver or Loon* of Willughby; and *Northern Diver* of Pennant, (Br. Zool.): and the *Female** is *Colymbus Immer* of Linnæus; *Colymbus maximus Gesneri* of Ray; *Mergus major* of Brisson; *Le Grand Plongeon* of Buffon; *Ember Goose* of Sibbald; and *Imber Diver* of the British Zoology. It is the *Colymbus torquatus* of Brunnich; and not to weary the reader with more scientific names, it is the *Schwarzhalsiger Seetaucher, Eis-Taucher, Grosse Halb-Ente*, and *Meer-Noering* of the Germans; *Brusen* of the Norwegians; *Tuulik* of the Greenlanders; *Mookeeseu-Mooquo* of the Cree Indians; *Tulkyeh* of the Chipewyans; *Kaglooleek* of the Esquimaux; *Inland Loon* of the Hudson's Bay residents; and *Trochydd mawr* of the antient British; it is provincially called by the modern British *Gunner* and *Greater Doucker*.

Habits, &c.—Fish is the principal *food* of this species, and the herring in particular, the *fry* of fish, crustaceans and marine vegetables. It *nestles* in small islands, and on the banks of fresh waters, and the female lays two eggs of an Isabella white, marked with very large and with small spots of a purplish ash. Dr. Richardson gives the following description of its manners:—'Though this handsome bird is generally described as an inhabitant of the ocean, we seldom observed it either in the Arctic Sea or Hudson's Bay; but it abounds in all the interior lakes, where it destroys vast quantities of fish. It is rarely seen on land, its limbs being ill fitted for walking, though admirably adapted to its aquatic habits. It can swim with great swiftness, and to a very considerable distance under the water; and when it comes to the surface, it seldom exposes more than the neck. It takes wing with difficulty, flies heavily, though swiftly, and frequently in a circle round those who intrude on its haunts. Its loud and very melancholy cry, like the howling of the wolf, and at times like the distant scream of a man in distress, is said to portend rain. Its flesh is dark, tough, and unpalatable. We caught several of these birds in the fishing nets, in which they had entangled themselves in the pursuit of fish.' The species is sometimes taken even in the south of England. Montagu mentions one which

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* But see Temminck's description of the varying plumage according to age above given, &c.

[illegible] In a few days it became [illegible] to the call from one side [illegible] other, and would take food from the [illegible] an injury in the head, which [illegible] the other was a little [illegible] it could by incessantly [illegible] were thrown into the pond. [illegible] eat flesh; and when it [illegible] water, it [illegible] body along upon the ground [illegible] the breast against the ground: and [illegible] again to the water in a similar manner. In swimming and diving the legs only were used, and not the wings; and by their situation so far behind, and their little [illegible] from the line of the body, it is enabled to propel itself in the water with great velocity in a straight line, as well as turn with astonishing quickness. In the winter of 18[illegible], according to Mr. Graves, during the intense frost, two fine male birds were taken alive in the Thames below Woolwich, and were kept in confinement for some months. They eagerly devoured most kinds of fish or offal. At the approach of spring they began to show great uneasiness in their confinement, though they had the range of an extensive piece of water, from which they ultimately escaped in the month of April. The distance of the river from the pond in which they were confined was several hundred yards, but they made their escape, and two birds resembling them [illegible] were seen in the river in that neighbourhood for several days after they were missed, and though repeatedly shot at, they escaped by diving.

G[illegible]—The arctic seas of the New and Old World [illegible] abundant in the Hebrides, Norway, Sweden, and Russia [illegible] visitors along the coasts [illegible]. The young in winter are very rare on the [illegible] in Germany, France, and Switzerland: the old birds are never seen there. (Temminck.) It is a [illegible] rare visitant to these islands, especially to the southward.

[illegible]

[illegible] *Colymbus* Mergus, Cuvier: [illegible] Temminck; *Mergus*, Ray, V[illegible] [illegible] the passage [illegible] subge-[illegible]

[illegible] which is to be [illegible] divided [illegible] two dis-[illegible] it is [illegible] the amount [illegible] is not [illegible] been explained. It is used to signify the half-yearly payments of the perpetual and terminable annuities which constitute the public debt of the country, and does not therefore strictly express that which the word is made to imply. The payment of these so called dividends is managed on the part of the government by the bank of England, which receives a compensation from the public for the trouble and expense attending the employment. The exact number of individuals who are entitled to receive these half-yearly payments is not known. The following statement exhibits the number of distinct sums paid by different warrants to various classes of annuitants at the last four periodical payments, but the number of annuitants is not nearly so great as the number of distinct warrants, because many individuals are possessed of annuities due at the same periods of the year, which are included under different heads or accounts in the books of the Bank, as bearing different rates of interest, or being otherwise under different circumstances: and besides, many persons hold annuities which are payable at both half-yearly periods. It is clear, however, from the following figures, that the greater part of the public creditors are entitled to annuities for only small sums, more than nine-tenths of the payments being for sums not exceeding 100*l*., and nearly one-half for sums not exceeding 10*l*.

Sums included in the Warrants.	5 July, 1836.	10 Oct. 1836.	5 Jan. 1837.	5 April, 1837.
	Number of Warrants.	Number of Warrants.	Number of Warrants.	Number of Warrants.
Not exceeding £5	38,[illegible]	[illegible]	59,501	[illegible]
———— 10	[illegible]	[illegible]	[illegible]	14,[illegible]
———— 50	65,[illegible]	3[illegible]	6[illegible]	[illegible]
———— 100	17,[illegible]	8,[illegible]	17,5[illegible]	[illegible]
———— [illegible]	[illegible]	4,[illegible]	[illegible]	4,[illegible]
———— [illegible]	3,[illegible]	1,4[illegible]	3,[illegible]	1,[illegible]
———— [illegible]	1,[illegible]	[illegible]	1,[illegible]	[illegible]
———— [illegible]	[illegible]	4[illegible]	[illegible]	[illegible]
———— [illegible]	[illegible]	151	[illegible]	[illegible]
Exceeding [illegible]	130	6[illegible]	1[illegible]	[illegible]
	157,318	91,531	15[illegible]	9[illegible]

DIVING-BELL. [SUBMARINE DESCENT.]

DIVINING ROD, a forked branch, usually, but not always, of hazel, by which it has been pretended that minerals and water may be discovered in the earth, the rod, if slowly carried along in suspension, dipping and pointing downward, it is affirmed, when brought over the spot where the concealed mine or spring is situated. Other mysterious powers, such as that of discovering the lost boundaries of lands, and even of detecting the birth-place and parentage of foundlings, have also been attributed to the divining rod. The rod is sometimes called the Virgula Divina, or the Baculus Divinatorius, or the rod of Aaron, or the Caduceus (after the wand of Mercury). But, although a rod or wand has been the distinguishing ensign of the professors of magic in all ages and countries, and rabdomancy, or divination by the rod, was familiar to the ancient nations, the form, the material, and the mode of using the divining rod of the modern miners and water-finders seem to be superstitions of comparatively recent introduction. Many persons with some pretensions to science have been believers in the powers ascribed to the divining rod. George Agricola, the able and learned German metallurgist of the sixteenth century, and in later times John Sperlingius and Theodore Kirchmayerus, who have both written *Disputations* on the rod, all say that [illegible] is in it. Richelet, in his Dictionary (art. *Baguette divinatoire*), confesses that after what he has seen he cannot entertain any doubt as to its possessing the wonderful qualities ascribed to it. The learned Morhoff, who was eminent for his scientific as well as literary knowledge, admits that it is not clear to him whether the effects are natural or the result of demoniacal agency. A. M. Thouvenel published at Paris in 1781 a Memoir on the relation of the phenomena of the Divining rod to those of Electricity and Magnetism; and our countryman Pryce, in his 'Mineralogia Cornubiensis' (fol. 1778) has collected accounts of numerous successful experiments which he says were performed by the instrument. Some remarks on the rod and on the attempts that have been made to explain its [illegible] operation may be found in the Marquis le Gendre's 'Traité de l'Opinion,' liv. iii. chap. 6, and liv. iv. chap. 2; and there is a discussion of the subject which is well worth reading both for the reflections and some curious facts [illegible] in Bayle's 'Dictionary,' [illegible] (See also Morhof, [illegible])

DIVINITY. [THEOLOGY.]

DIVISIBILITY, DIVISOR. Any number or fraction admits of division by any other, in the extended arithmetical sense which considers *parts* of a time as well as times. Thus 12 contains 8 a time and half a time, or 12 divided by 8 gives 1½. The adjective *divisible* is nevertheless applied, not to any number as compared with any other, but only as compared with such numbers as are contained a whole number of times in the first. Thus 12 is said to be divisible by 6, and is said to be not divisible by 8. Or, both in arithmetic and algebra, divisible means 'divisible without introducing fractions into the result.'

The number of divisors which any number admits of is found as follows. Ascertain every prime number which will divide the given number, and how many successive times it will do so. Add one to each of these numbers of times, and multiply the results together. Thus, the number 360 is made by multiplying together 2, 2, 2, 3, 3, 5 ; or is divisible by 2 three times ($3+1=4$), by 3 twice ($2+1=3$), and by 5 once ($1+1=2$). And $4 \times 3 \times 2 = 24$, the number of divisors which 360 admits of. But among the 24 divisors are included 1 and 360.

DIVISION, the process of ascertaining how many times and parts of times one number is contained in another. The usual arithmetical rule consists in a continual approximation to the result required. We write underneath,—1, the common process ; 2, that of which it is an abbreviation ; 3, a short summary of the *rationale*.

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8)23475(2934⅜          8)23475(2000
  16                      16000   900
  --                      -----
   74                      7475    30
   72                      7200     4
   --                      ----
    27                      275
    24                      240
    --                      ---
     35                      35
     32                      32
     --                      --
      3                       3
```

The whole contains a number as often as all its parts put together contain that number: and 23 meaning 23,000, and 16 being the highest multiple of 8 below 23, then the 16,000, which is part of 23,000, contains 2000 eights, and it is left to be seen how often the remaining 7000, and the 475 (making 7475) contain 8. The 74 is 7400, and 9 times 8 being 72, the 7200 which is part of 7400, contains 900 eights, and it is left to be seen how often the remaining 200 with the 75 (making 275) contains 8. The 27 is 270, of which the part 240 contains 30 eights, and the remaining 30 together with the 5 (making 35) is left. Of this, 32 contains 4 eights, and the remaining 3 does not contain 8 so much as one time, but the eighth part of 3 units is three times the eighth part of a unit, or $\frac{3}{8}$: whence the answer.

In finding how many times, or parts of times, one fraction is contained in another, the following principle is applied. If two numbers or fractions be multiplied by any number, the number of times, or parts of times, which the first contains the second, is not altered. Thus 7 contains 2 just as 14 contains 4, or as 21 contains 6, &c. If then we take two fractions, such as $\frac{3}{7}$ and $\frac{2}{11}$, it follows that $\frac{3}{7}$ contains $\frac{2}{11}$ just as 77 times $\frac{3}{7}$ contains 77 times $\frac{2}{11}$, or as 33 contains 14: that is, 2 times and $\frac{5}{14}$ of a time. This may easily be shown to give the common rule.

The division of one decimal fraction by another presents a difficulty, slight indeed, but quite sufficient to prevent most persons from becoming expert in the use of tables. The rules given are frequently incomplete, and always such as would render even a practised computer liable to mistake. The question is how to place the decimal point rightly in the result, and this may be best done as follows:—

1. Alter the dividend or divisor by annexing ciphers, until both have the same number of decimal places. This being done—

2. Annex as many ciphers to the dividend, or take away as many from the divisor (or partly one and partly the other) as there are to be decimal places in the result: then divide as in whole numbers, and mark off the given number of decimal places.

Example I. Find out, to three decimal places, how often ·076 is contained in 32·1.

First step: ·076 and 32·100.
Second step: ·076 and 32·100000.
76)32100000(422368—rem. 32.
Answer. 422·368.

Example II. Find out, to 7 decimal places, how often (what fraction of a time) 236·5 is contained in ·001.

First step: 236·500 and ·001.
Second step: 236·5 and ·00100000; namely, *two* ciphers struck off the divisor and *five* annexed to the dividend (making *seven*).

2365)100000(42—rem. 670.
Answer. ·0000042.

In making complicated divisions, it is much the shortest plan, and very much the safest, to begin by forming the first nine multiples of the divisor by continued addition (forming the tenth for proof).

DIVORCE (divortium, a divertendo, from diverting or separating), the legal separation of husband and wife. Divorce is of two kinds, *à mensâ et thoro*, from bed and board; and *à vinculo matrimonii*, from the bonds of the marriage itself. The divorce *à mensâ et thoro* is pronounced by the spiritual court for causes arising subsequent to the marriage, as for adultery, cruelty, &c.: it does not dissolve the marriage, and the parties cannot contract another marriage. [BIGAMY.] In fact it is equivalent only to a separation.

The divorce *à vinculo matrimonii* can be obtained in the spiritual courts for causes only existing before the marriage, as precontract, consanguinity, impotency, &c. This divorce declares the marriage to have been null and void, the issue begotten between the parties are bastardized, and the parties themselves are at liberty to contract marriage with others.

From the curious document preserved by Selden (Uxor Ebraica, c. xxx., vol. iii., 845, folio ed. of his works), whereby John de Cameys, in the reign of Ed. I., transferred his wife and her property to William Paynel; and also, from the reference to the laws of Howel the Good, at the end of this article, it would seem that in the early periods of English law a divorce might be had by mutual consent; but all trace of such a custom is lost. We know however (3 Salk. *Rep.* 138) that, until the 44th Eliz., a divorce *à vinculo matrimonii* might be had in the ecclesiastical courts for adultery; but in Foljambe's case, which occurred in that year in the Star Chamber, Archbishop Bancroft, upon the advice of divines, held that adultery was only a cause of divorce *à mensâ et thoro*.

The history of the law of divorce in England may perhaps be thus satisfactorily explained. Marriage being a contract of a civil nature, might originally be dissolved by consent. When, in the progress of civilization, various regulations were prescribed, the ordinary courts of justice asserted their jurisdiction over this as well as every other description of contract. At length, the rite of marriage having been elevated to the dignity of a sacrament by Pope Innocent III., A.D. 1215, the ecclesiastical courts asserted the sole jurisdiction over it. In the course of time the power of these courts was again controlled, and the sole jurisdiction for granting divorces for matter arising subsequently to the marriage, was vested in the superior court of the kingdom, the House of Lords, where it was less likely to be abused than by the ecclesiastical authorities, who, it is notorious, granted these and other dispensations for money.

Marriage is now, by the law of England, indissoluble, for matter arising subsequently, by the decree of any of the ordinary courts, but divorce *à vinculo matrimonii* may still for adultery, &c., be obtained by act of parliament. For this purpose it is necessary that a civil action should have been brought in one of the courts of law against the adulterer [ADULTERY], and damages obtained therein, or some sufficient reason adduced why such action was not brought, or damages obtained, and that a definitive sentence of divorce *à mensâ et thoro* should have been pronounced between the parties in the ecclesiastical court; which sentence cannot be obtained for the adultery of the wife, if she recriminates, and can prove that the husband has been unfaithful to the marriage vow; and further, to prevent any collusion between the parties, both houses of parliament may, if necessary, and generally do require satisfactory evidence that it is proper to allow the bill of divorce to pass.

The first proceeding of this nature was in the reign of Edward VI., and bills of divorce have since greatly increased; above seventy such bills have been passed since the commencement of the present century. Where the injured party can satisfy both houses of Parliament, which are not bound in granting or withholding the indulgence by any of those fixed rules which control the proceedings of ordinary courts of judicature, a divorce is granted. It is a cause of complaint that the expenses of the proceeding are so considerable as to amount to an absolute denial of the relief to the mass of society; indeed from this circumstance divorce bills have not improperly been called the privilege of the rich. There is an order of the House of Lords that, in every divorce bill on account of adultery, a clause shall be inserted prohibiting the marriage of the offending parties with each other; but this clause is generally omitted: indeed it has been inserted but once, and that in a very flagrant case. But it is not unusual for parliament to provide that the wife shall not be left entirely destitute, by directing a payment of a sum of money, in the nature of alimony, by the husband, out of the fortune which he had with the wife. By the divorce *à vinculo matrimonii* the wife forfeits her dower. [DOWER.]

The causes admitted by various codes of laws as grounds for the suspension or dissolution of the contract of marriage, as well as the description of the tribunal which had or in some degree has jurisdiction over the proceedings, are various, and indicative of the degree of civilization of the nations among whom they prevailed.

According to the law of Moses (24 *Deut.* i.), 'When a man hath taken a wife and married her, and it come to pass that she find no favour in his eyes, because he hath found some uncleanness in her, then let him write her a bill of divorcement and give it in her hand, and send her out of his house.' After 90 days, the wife might marry again. But after she had contracted a second marriage, though she should be again divorced, her former husband might not take her to be his wife. About the time of our Saviour, there was a great dispute between the schools of the great doctors Hillel and Shammai as to the meaning of this law. The former contended that a husband might not divorce his wife but for some gross misconduct, or for some serious bodily defect which was not known to him before marriage; but the latter were of opinion that simple dislike, the smallest offence, or merely the husband's will, was a sufficient ground for divorce. This is the opinion which the Jews generally adopted, and particularly the Pharisees, which explains their conduct when they came to Jesus 'tempting him, and saying unto him, Is it lawful for a man to put away his wife for every cause?' (*Matth.* xix.) The answer was, 'Moses, because of the hardness of your hearts, suffered you to put away your wives, but from the beginning it was not so.' From this it is evident that Christ considered that the law of Moses allowed too great a latitude to the husband in his exercise of the power of divorce, and that this allowance arose from 'the hardness of their hearts;' by which of course we are to understand that they were so habituated to previous practices, that any law which should have abolished such practices would have been ineffectual. All it could do was to introduce such modifications with the view of diminishing the existing practices, as the people would tolerate. The form of a Jewish bill of divorcement is given by Selden, *Uxor Ebraica*, lib. iii, ch. 24; and see Levi's *Ceremonies of the Jews*, p. 146.

As the customs of Oriental nations do not change, but have continued the same from the earliest periods, we may presume that the usages in the matter of divorce now existing in Arabia are the same, or nearly so, as when Mohammed endeavoured to reform them among the tribes [illegible] [illegible]. An Arab may divorce his wife on the slightest occasion; he has only to say to her 'Thou art divorced,' and she becomes so. So easy and so common is the practice, that Burckhardt assures us that he has seen Arabs not more than 45 years of age who were known to have had 50 wives, yet the Arabs have rarely more than one wife at a time.

By the Mohammedan law a man may divorce his wife twice without any ceremony; when this is done, he pays her a portion, generally one-third of her dowry. He may divorce her twice, and take her again without her consent: but if he divorce her a third time, or put her away by a triple divorce [illegible] in the same sentence, he cannot receive her again till she has been married and divorced by another husband, who must have consummated his marriage with her.

Here then we see that the Jewish lawgiver required a bill of divorcement to insure due consideration; he altogether prohibits the return of the wife after a marriage contracted with another man. The Arabian legislator required the words 'Thou art divorced' to be repeated three times before the marriage was irrevocably dissolved by the husband. And again, working on the feelings of delicacy inherent in man's nature, after such irrevocable divorce, he required a marriage with another man, actual consummation, and subsequent divorce, before the first husband could take back his wife. Moses, on a somewhat different principle, absolutely prohibited the remarriage of the parties to the first marriage after a second had been contracted.

By the Jewish law it appears that a wife could not divorce her husband; but under the Mohammedan code, for cruelty and some other causes, she may divorce him: and this is the only instance in which Mohammed appears to have been more considerate towards women than Moses.

(Sale's *Koran*; Lane's *Modern Egyptians*; Hamilton's *Hedaya*, and the *Mishcat ul-Masábih*; Selden's *Uxor Ebraica*: and see the case of *Lindo* v. *Belisario*, 1 Hagg. 216, before Lord Stowell.)

Among the Hindoos, and also among the Chinese, a husband may divorce his wife upon the slightest grounds, or even without assigning any reason. Some of the rules mentioned by the Abbé Dubois, as laid down in the 'Padma Purana,' one of the books of highest authority among the Hindoos, show their manner of thinking concerning the conduct of their wives. 'In every stage of her life, a woman is created to obey. At first she yields obedience to her father and mother; when married, she submits to her husband and her father and mother-in-law: in old age, she must be ruled by her children. During her life she can never be under her own control. If her husband laugh, she ought to laugh; if he weep, she will weep also; if he is disposed to speak, she will join in conversation. When in the presence of her husband, a woman must not look on one side and the other; she must keep her eyes on her master, to be ready to receive his commands. When he speaks, she must be quiet, and listen to nothing besides. When he calls her, she must leave every thing else, and attend upon him alone.' And in the Hindoo code it is said, 'The Creator formed woman for this purpose, viz., that children might be born from her.' The reasons for which, according to the Brahmanic law, a man may divorce his wife, may be seen in Colebrooke's *Digest of Hindoo Law*, vol. ii. p. 414, &c., 8vo. edit.; and Kalthoff, *Jus Matrimonii veterum Indorum* (Bonn, 1829, 8) p. 76, &c.

The laws in the several Grecian states regarding divorce were different, and in some of them men were allowed to put away their wives on slight occasions. The Cretans permitted it to any man who was afraid of having too great a number of children. The Athenians allowed it upon small grounds, but not without giving a bill containing the reasons for the divorce, to be approved (if the party divorced made an appeal) by the chief archon. The Spartans seldom divorced their wives; indeed the ephori fined Lysander for repudiating his wife. Ariston (Herod. vi. 63) put away his second wife, but it seems to have been done rather to have a son, for his wife was barren, than according to the custom of the country. Anaxandrides (Herod. v. 39) was strongly urged by the ephori to divorce his barren wife, and on his not consenting, the matter was compounded by his taking another wife: thus he had two at once, which Herodotus observes was contrary to Spartan usage.

By the laws of the early Romans, the husband alone was permitted to dissolve the marriage, but not without just cause, and a groundless divorce was punished by the forfeiture of the husband's effects, one-half of which went to the wife. Adultery, drunkenness, or counterfeiting the husband's keys, were considered good causes of divorce. For about 500 (Dion. Hal., ii. 25; Gellius, iv. 3; Plutarch, *Vit. Rom. et Num.*, &c.) years after the foundation of the city there was no instance of this right being exercised by the husband; but afterwards divorces became very frequent, not only for sufficient reasons, but on frivolous pretexts, and the same liberty was enjoyed by the women as by the men.

The maxim of the civil law was, that matrimony ought to be free, and either party might renounce the marriage union at pleasure. It was termed *divortium sine causâ*, or *sine ullâ querelâ*, i.e., divorce without cause, or without question; and the principle, *bona gratia matrimonium dissolvitur*, matrimony is dissolved at pleasure, is solemnly laid down in the pandects. The abuse of divorce prevailed in the most polished ages of the Roman republic, though, as has been said, it was unknown in its early history. The Emperor Augustus is said to have endeavoured to restrain this abuse by requiring the observance of certain ceremonies to a valid divorce, according to the manner in which the marriage had been celebrated; thus, if there had been a marriage contract, it was torn in the presence of seven witnesses, the keys were taken from the wife, and a certain form of words was pronounced by the husband or by a freedman; but this check was overpowered by the influence and corruption of manners. Voluntary divorces were abolished by one of the *novels* of Justinian, but they were afterwards revived by another *novel* of the Emperor Justin. In the *novel* restoring the unlimited freedom of divorce the reasons for it are assigned; and while it was admitted that nothing ought to be held so sacred in civil society as marriage, it was declared that the hatred, misery, and crimes, which often flowed from indissoluble connexions, required as a necessary remedy the restoration of the old law by which marriage was dissolved by mutual will and consent. This practice of divorce is understood to have continued in the Byzantine or eastern empire till the ninth or tenth century, and until it was finally subdued by the influence of Christianity.

On a divorce for infidelity, the wife forfeited her dowry; but if the divorce was not made for any fault of hers, her whole dowry was restored, sometimes all at once, but usually by three different payments. In some instances, however, where there was no infidelity on the part of the wife, only part was restored. On the Roman divorce and dowry, see *Dig.* xxiv. tit. 3.

Among the antient Britons, it may be collected from the laws of Howel the Good that the husband and wife might agree to dissolve the marriage at any time; in which case, if the separation took place during the first seven years of the marriage, a certain specified distribution of the property was made, but after that period the division was equal. No limit was set to the husband's discretion in divorcing his wife, but the wife could only divorce her husband in case he should be leprous, have bad breath, or be impotent, in which cases she might leave him and obtain all her property. The parties were at liberty to contract a fresh marriage; but if a man repented of having divorced his wife, although she had married another man, yet if he could overtake her before the consummation of the marriage, or, as the law expresses it, 'with one foot in the bed of her second husband, and the other outside,' he might have his wife again. Adultery was punishable by fine.

The laws of Scotland relating to divorce differ widely from those existing in England: there, a divorce *à vinculo matrimonii* is a civil remedy, and may be obtained for adultery, or for wilful desertion by either party, persisted in for four years, though to this a good ground of separation is a defence. But recrimination is no bar to a divorce as it is in England.

In the Dutch law there are but two causes of divorce *à vinculo matrimonii*, viz., adultery and desertion.

In Spain the same causes affect the validity of a marriage as in England, and the contract is indissoluble by the civil courts, matrimonial causes being exclusively of ecclesiastical cognisance. (*Instit. Laws of Spain.*)

The law of France, before the Revolution, following the judgment of the Catholic Church, held marriage to be indissoluble; but the legislators of the early revolutionary period permitted divorce at the pleasure of the parties, where incompatibility of temper was alleged. In the first three months of the year 1793, the number of divorces in the city of Paris alone amounted to 562, the marriages to 1785, a proportion not much less than one to three; while the divorces in England for the previous century did not amount to much more than one-fifth of the number. (Burke's *Letters on a Regicide Peace.*) Burke further states that he followed up the inquiry through several subsequent months till he was tired, and found the results still the same. It must be remembered however that Burke wrote in the spirit of an advocate; that the period he chose was that immediately following the promulgation of the law, when all couples previously discontented with each other obtained divorces; and that if his calculations had fully borne out his statement, he would have given them in his pamphlet, which was written for a political purpose, and he would not have rested satisfied with indefinite allegations. It was generally admitted however that the license was too great. The Code Napoleon accordingly restricted the liberty, but still allowed either party to demand a divorce on the ground of adultery committed by the other; for outrageous conduct, or ill usage; on account of condemnation to an infamous punishment; or to effect it by mutual consent, expressed under certain conditions. By the same code a woman could not contract a new marriage until the expiration of ten months from the dissolution of the preceding.

On the restoration of the Bourbons a law was promulgated (8th May, 1816), declaring divorce to be abolished; that all suits then pending for divorce for definite cause, should be for separation only, and that all steps then taken for divorce by mutual consent should be void; and such is now the law of France.

It must be borne in mind, however, that the Roman Church, for the purpose of increasing its revenue, has at all times claimed the right to dissolve marriage by dispensation; and therefore this power of divorce still exists in France, and all Roman Catholic countries, independent of the law of the land. It has since been decided by the Cour de Cassation that the conjugal infidelity of the husband is a bar to a suit instituted by him for divorce on the ground of the wife's adultery. (M'Kenna's *Notes on the Code Civil.*)

In the United States marriage, though it may be celebrated before clergymen as well as civil magistrates, is considered as a civil contract. The causes of divorce, and the facility or difficulty of obtaining it, are by no means the same in the several states. The more general causes of a divorce *à vinculo matrimonii* are, former marriage, physical incapacity, or consanguinity; by the Connecticut law, fraudulent contract; and by the New York code, idiotcy and insanity, and either party being under the age of consent. Adultery is also a cause of divorce *à vinculo matrimonii*; and the laws of some of the states prohibit the guilty party from marrying again. If the husband or wife is absent seven years, or, by the laws of some States, three years, and not heard from, the other is at liberty to marry again; and in some states, if the husband desert the wife, and make no provision for her support during three years, being able to make such provision, the wife can obtain a divorce. Extreme cruelty in either party is also generally a cause of divorce *à vinculo matrimonii*. In many of the states applications to the legislature for divorce, in cases not provided for by the statutes, are very frequent. In New York and New Jersey, divorce is a subject of Chancery jurisdiction, from which, as in other cases, questions of law may be referred to a jury for trial. In New Hampshire, joining the religious society of Shakers, who hold cohabitation unlawful, and continuing in that society for three years, is sufficient cause for a divorce. But in most of the States the courts of law have cognizance of divorce. The laws prescribe the provision to be made for the wife in case of divorce, confiding to the courts however some degree of discretion in fixing the amount of alimony.

It is very questionable, says Chancellor Kent, whether the facility with which divorces can be procured in some of the States be not productive of more evil than good; and he states that he has had reason to believe, in the exercise of a judicial cognizance over numerous cases of divorce, that adultery was sometimes committed on the part of the husband for the very purpose of the divorce.

(Kent's *Comm.*; *Ency. Americ.* Upon the general advantages of indissolubility, as opposed to an unlimited right of divorce, see Hume's *Essay on Polygamy and Divorce*; Paley's *Moral Philosophy*; and the judgment of Lord Stowell in Evans *v.* Evans, 1 Hagg. *Repts.*, 48; Milton, in his famous treatise, advocates the increased facility of obtaining a divorce; and see Gibbon, *Decl. and Fall*, c. 44.)

DĪWĀN is a Persian word familiar to readers of works relating to the East, in the sense of—1st. a senate, or council of state; and, 2nd., a collection of poems by one and the same author. The earliest acceptation, however, in which we find it employed is that of a muster-roll, or military pay-book. The Arabic historian, Fakhreddin Rāzi, informs us that when, in the caliphat of Omar, the second successor of Mohammed, the conquests of the Mussulmans assumed an extensive character, the equal distribution of the booty became a matter of great difficulty. A Persian marzbān, or satrap, who happened to be at the head-quarters of the caliph at Medinah, suggested the adoption of the system followed in his own country, of an account-book, in which all receipts and disbursements were regularly entered, along with a list duly arranged, of the names of those persons who were entitled to a share in the booty. With the register itself, its Persian appellation (dîwân) was adopted by the Arabs. (Freytag, *Locmani Fabulæ et plura loca ex codd. historicis selecta*, &c., pp. 32, 33; Henzi, *Fragmenta Arabica*, St. Petersburg, 1828, p. 36, et seq.) Whether a council of state was subsequently called diwân, as having originally been a financial board appointed to regulate the list (dîwân) of stipendiaries and pensioners, or whether it was so called as being summoned according to a list (dîwân) containing the names of all its members, we are unable to determine. The opinion that a body of councillors should have received this appellation, as has been asserted by some, in consequence of the expression of an antient king of Persia, *înân dîwân end*, 'these (men) are (clever like) devils,' will scarcely be seriously entertained by any one. The word 'dîwân' is also used to express the saloon or hall where a council is held, and has been applied to denote generally a state chamber, or room where company is received. Hence probably it has arisen that the word 'divan,' in several European languages, signifies a sofa. Collections of poems in Persian, Arabic, Turkish, Hindustani, &c., seem to have received the appellation 'dîwân' from their methodical arrangement, inasmuch as the poems succeed one another according to the alphabetic order of the concluding letters of the rhyming syllables, which are the same in all the distichs throughout each poem.

DIXMUIDEN. [Flanders, West.]

DIZIER, ST., a town in France, in the department of Haute Marne, on the right north bank of the Marne, and on the road from Paris by Meaux and Châlons to Bar le Duc, Nancy, and Strasburg. It is 118 miles east by south of Paris in a straight line, or 138 miles by the road; in 48° [illegible] N. lat. and [illegible] 56′ E. long.

In 1544 St. Dizier made a vigorous resistance against the Emperor Charles V., who had invaded France, but was [illegible] to surrender: it was restored at the subsequent peace. In later times its fortifications have been neglected. Two engagements were fought near St. Dizier, in 1814, between the French and the allies who had invaded France.

The town is agreeably situated, and is well built: it is [illegible] walks: the houses were formerly of [illegible] after a great fire which happened about sixty [illegible] were mostly rebuilt of stone. The town-[illegible] of modern erection; in front [illegible] market.

The [illegible] was [illegible] for the town, or 6197 [illegible]. The inhabitants carry on a con-[illegible] round the [illegible] ship-building. The navi-[illegible] here. Oil-cloth and some [illegible] and formerly (if not at [illegible] cloths, and casks. [illegible] and there is coal, but we [illegible]

[illegible] IVANOVITCH, was born in 1760, [illegible] his father, who was [illegible] possessed an estate. [illegible] twelfth year, he [illegible] at Simbirsk when that part of [illegible] state by Pugat-[illegible] which his family deter-[illegible] was sent to St. Petersburg, where [illegible] regiment of guards, and [illegible] in which he con-[illegible] of the emperor Paul when an ap-[illegible] was bestowed upon him. [illegible] Alexander he was made successively [illegible] and privy counsellor, and finally retired [illegible] with a pension and the order of St. Vla-[illegible] Although a life passed in such [illegible] literary pursuits [illegible] natural attachment [illegible] as [illegible] and with such success that [illegible] among contemporary writers, the [illegible] Russian language, [illegible] and elegance [illegible] passed through many [illegible] principally of odes, epistles, satires, tales, and fables, in which last-men-tioned species of composition—a very favourite one with [illegible] countrymen—he particularly excelled; and if we ex[illegible] Krilov, he occupies the first rank among the Russian [illegible] lists. By some he has been styled the Lafontaine of Ru[illegible] as well on account of the refined tone of his subjects a[illegible] studied simplicity of his language. In his poetical tales [illegible] stands almost alone—certainly unrivalled—among [illegible] countrymen, not less for the playfulness and shrewd[illegible] of his satire than for the peculiar happiness and finish [illegible] his style. His odes likewise possess considerable [illegible] but as a lyric poet he falls short of Lomonosov, Derz[illegible] and Petrov.

DNIEPER, DNYEPR, or DNEPR, also called [illegible] *Ousi* by the Tartars, one of the largest rivers of Eu[illegible] Russia, and, next to the Danube, the most considerabl[illegible] the streams that discharge themselves into the Black S[illegible] It rises in the circle of Viasma, in the northern part of [illegible] government of Smolensk, near the sources of the D[illegible] and Volga, and among the swamps of the Alansk or A[illegible]nian hills on the southern declivity of the Volkonsky f[illegible] It flows generally in a south-south-west direction t[illegible] approaches the town of Smolensk, where it inclines [illegible] to the west, and makes its way to Orsza, whence it [illegible] a southerly course through the government of Mohil[illegible] which it divides in part from that of Minsk. In this [illegible] of its course it is increased by numerous tributary stre[illegible] among others the Druetz, Sosja, Berezina, which [illegible] is united to the Dwina by means of a canal, Merya, [illegible] Gryaza. After forming the boundary between parts [illegible] the governments of Minsk and Tshernigoff, it enters th[illegible] of Kieff, where it immediately receives the Przupiez, w[illegible] the Muchaviec and Orginski canals connect with [illegible] Vistula and Niemen, and before it reaches Kieff, the De[illegible] Usha, Osler, and other rivers. Continuing its course so[illegible] eastwards, the Dnieper, below Kieff, forms the western [illegible] south-western limit of the government of Pultava, and [illegible] passing between the governments of Ekaterinoslaf [illegible] Cherson, it bends again to the south-west; its waters [illegible] of Kieff having been increased by the Rope, Bazat[illegible] Psjol, Vorskia, Orel, Samara, and other streams. It [illegible] flows between the governments of Duchoborzen (the N[illegible] Steppes) and Cherson, and at length forms, in conjun[illegible] with the Bog, a large liman, or swampy lake, nearly [illegible] miles long, and from one to six broad, by which it dis-charges itself into the Black Sea. This liman extends fr[illegible] Cherson to Oczakoff.

The entire length of the Dnieper with its windings [illegible] about 1000 miles: in a straight line it is about 650 fr[illegible] source to its mouth. Its upper basin comprises nearly [illegible]teen degrees of longitude: from 24° to about 37½° eas[illegible] average width is estimated at 700 paces, and the su[illegible] which this river and its tributaries drain is exceeded [illegible] among European streams by that of the Danube. The D[illegible]per flows for the most part between high banks, the gre[illegible] elevation of which is along the eastern side. The u[illegible] part of its course is through a marshy country, and [illegible] middle and lower course it passes over many rocks. [illegible] broader, deeper, and more rapid than the Don, and is [illegible]vigable from Smolensk to Kieff; but below the latter [illegible] near Kidack, the navigation is interrupted for about [illegible] miles by thirteen cataracts called Poroge, as well as by [illegible]mous blocks of stone; this space is passable for vess[illegible] small draught during the spring months only, for [illegible] reason all merchandize intended for Cherson or the B[illegible] Sea is unladen at Old Samara, whence it is convey[illegible] land to Alexandrofsk, at the mouth of the Moscofsk[illegible] tance of about forty-six miles by land. From this sp[illegible] mouth of the Dnieper, a distance of about 260 miles, the [illegible]gation is unimpeded. Below the cataracts, and as far as [illegible] liman of this river, upwards of seventy islands occur [illegible] fact the Dnieper in this interval has no open water for [illegible] miles together. Kaskava and Jedesa Ostrowa, the [illegible] of these islands, became a place of refuge to the Zap[illegible] Cossacks, who established their Setcha, or hea[illegible] upon them. The islands produce a grape called B[illegible] which resembles the currants of Corinth. They are [illegible] serpents, and abound in a sort of wild cat, which [illegible] shrew-mouse.

As the Dnieper flows through more than nine deg[illegible] of latitude (from near 56° to 46½° N. lat.), there is [illegible] diversity of climate in various parts of its basin: at S[illegible]lensk the waters freeze in November, and [illegible] ice-bound until April; at Kieff they are frozen from January to March only. The river abounds in fish, particularly the sturgeon, carp, pike, and shad. There are bridges across it at Smolensk and Kieff; the latter, which is 1638 paces in length, and constructed with rafts, is removed about the end of October and replaced in the spring, as it would otherwise be destroyed on the breaking up of the ice. This river is the Borysthenes of the Greeks and Danapris of the middle ages. It is first mentioned by Herodotus (iv. 53), who, though professing his ignorance of its source, has shown very clearly that he was well acquainted with the river. He says that it was known for forty days' sail upwards, but no further: the large fish which he mentions as used for salting is probably the sturgeon. With the exception of the more southerly parts, its banks have long been inhabited by races of Sclavonian origin. Towards the mouth, from the Ross on the right, and the Vorskla and Sula on the left bank, the country was for a long time nothing better than a steppe, where the nomadic tribes of the Petchenegues and afterwards of the Polovtsi fed their numerous flocks.

Since the last peace with Turkey and the partition of Poland, both banks of the Dnieper are become the property of Russia. The principal towns on its banks are Smolensk, Mohileff, Kieff, Ekaterinoslaf, and Cherson.

DNIESTER, DNYSTER, or DNESTR, one of the principal rivers of European Russia, has its source in a small lake on the Mysidowaiska, one of the north-eastern declivities of the Carpathian mountains lying in the circle of Sambor, in the Austrian kingdom of Galicia, and in about 49° N. lat. Within this kingdom the Dniester receives the Tesmenica, Stry, Swica, Lomnica, and Bistryca, on its southern, and the Lipa, Strypa, and Sered, on its northern bank. After passing the town of Sambor, it pursues a south-easterly course to Halicz, Mariampol, and Zaleszczyki. Thence it runs in an E.N.E. direction to Chotym, at the north-western extremity of Bessarabia, where, leaving the Austrian, it enters the Russian territory. At Chotym it receives the Podhorce, which separates Galicia from the government of Podolia, and thence flows north-east, with numerous windings, to Kamenieck, the capital of that government. After passing Kamenieck, it has no tributaries of any great importance; the chief are the Smotrytz, Yaorlik, Kurzhovitz, Reut, and Botna. From Kamenieck it runs eastwards to Uschitza, and soon afterwards flows again south-easterly; forming in its descent to the Black Sea the boundary line first between Bessarabia and Podolia, and afterwards between the governments of Bessarabia and Cherson. From Uschitza it passes the towns of Mohileff, Yampol, Dubossari, Kishineff, the once important fortress of Bender, and Tiraspol, which is on the opposite bank. It enters the Black Sea by a broad liman, about nineteen miles in length and five in breadth, but not more than seven feet in depth, the mouth of which lies between Akerman and Ovidiopol. In front of the mouth is a long neck of low sand, which the sea, by forcing a passage at several points, has formed into islets.

The current of the Dniester is exceedingly rapid. The navigation commences at Halicz, but is interrupted at Porohy, two miles below Yampol, by two considerable falls and several whirlpools; and it does not become free again until it reaches Bender. As far as Old Sambor it flows through a deep broad valley, which afterwards expands on its eastern bank into an extensive plain; while on its right bank it is occasionally skirted by offsets from the Carpathian chain, varying from 150 to 250 feet in height. These elevations accompany its course as low down as Chotym, from which point it flows through an open flat country. The bed is muddy, and its waters, which are turbid and of a yellowish hue, and often broken by masses of rock, are frequently covered with foam; they rise and fall several times in the course of the day. The direct distance between the source of the Dniester and its mouth is estimated at about 320 miles; but, including its windings, its whole length is not less than 550 miles. Its average breadth is said to be 175 paces.

Before the left bank was in the possession of Russia the navigation of the Dniester was rendered very insecure by the predatory habits of the Turks and Tartars, but it is now become a safe means of transporting wood, grain, and merchandise from the Russian provinces to Odessa. The principal places at which vessels load and unload are Sirta and Sniatyn on the Austrian, and Zvanetz and Dubossari on the Russian side. The Dniester abounds in fish, particularly the sturgeon.

The Dniester was known to Herodotus (iv. 51), Ovid (Pont. iv. 10, verse 50), and the later Greeks, by the name of the Tyras; and it was subsequently called Danastris.

DO, in music, the name given by the Italians and the English to the first of the syllables used in solmization, and answering to the *ut* of the French.

DOAB. A word signifying *two waters*, which is used in Hindustan to denote any tract of land included between two rivers. There are several Doabs in Hindustan, but the district to which the name is most generally applied is situated between the Ganges and the Jumna. This district has its eastern extremity at Allahabad, whence it proceeds in a north-west direction to the hilly country in northern Hindustan, the northern frontier of the district of Saharunpore in the province of Delhi forming its north-western boundary. The length of this tract is more than 500 miles, and its mean breadth about 55 miles; it comprehends the districts of Saharunpore, Meerut, Alighur, Furruckabad, Kanouje, Etawah, Korah, Currah, and Allahabad. The prevailing character of the Doab is flatness and nakedness. A few clusters of trees are occasionally seen near the more considerable villages, but in other places many miles may be passed over without meeting with a tree. The only fuel consists of a low shrubby plant called palass, which is very inferior in quality. The principal productions are millet and barley, sugar, cotton, tobacco, and indigo. The straw of the millet is very serviceable as provender for cattle. One of the chief branches of industry, especially in the northern parts of the Doab, is the manufacture of coarse cotton cloths: the indigo produced is inferior in quality to that of Bengal. The temperature of the air in this part of India is liable to sudden and violent alternations; the range of the thermometer between the morning and afternoon is frequently 30, and sometimes as much as 40 degrees. In April and May, when the hot winds prevail, the thermometer often rises higher than 120 degrees in the shade, and at other seasons the temperature at daybreak is sometimes below the freezing point.

The southern part of the Doab came into the possession of the English in 1801, when it was acquired from the king of Oude. In 1803 the more northern part was ceded to the English by Dowlut Rao Scindia. The population is of a very mixed character, and consists of Jhats, Rajpoots, Patans, Thugs, and various other tribes, who, previous to the acquisition of the country by the English, had been much addicted to plunder, and dacoity or gang robbery was of frequent occurrence; this has since been greatly remedied. Three other districts to which the name of Doab is applied are situated in the province of Lahore. One of these, the Doab or Doabeh Barry, is included between the Ravey and Beyah rivers, and contains the cities of Lahore and Amritsir; the second, the Doabeh Jallinder, is included between the Beyah and the Sutlej, and forms the most fertile portion of the Seik territory; the third, the Doabeh Rechtna, comprehends the tract between the Ravey and the Chinaub; the principal towns contained in it are Dessiee, Eminabad, and Vazirabad.

DOBOKA (or Doboka-Varmegye), a large county of Transylvania, situated in the north-western part of that principality, and containing an area of about 1128 square miles. The eastern as well as the western parts are very mountainous, and the highest elevations are from 1800 to 2000 feet; the central districts are level, and form a continuation of the great Clausenburg Heide or heath, called by the natives the Mezoseg. Doboka is traversed by the Little Szamos or Samosch, the Bistritz, and Sehays. The climate in the higher regions is fresh and salubrious, but heavy and less healthy in the lower. The soil, though sandy and stony, is not unproductive; agriculture is confined chiefly to the midland districts. In the uplands there are excellent pastures, and the mountains are covered with forests, from which much timber is obtained. Some wine is produced, and the stock of horses, horned cattle, sheep, goats, and swine, is considerable. Honey and wax are made in large quantities. In 1778 this county contained 13,478 families, and 45,821 inhabitants; the present population is estimated at about 87,000. There are gold and silver mines, but they are not worked, nor is any advantage taken of the resources Doboka possesses in salt. There are 163 villages and 1 town in the county; the latter is called Sebes or Szeken, a privileged town with a municipality, and the seat of the Tabula Continua, or administrative board of Doboka.

It lies about twelve miles to the north-east of Clausenburg. The inhabitants derive their subsistence from their corn-lands and vineyards, but the extensive salt mines in its vicinity are no longer turned to account. Doboka, a Wallachian village to the west of Széék, which gives its name to the whole county, is encircled by mountains. Another spot of much note among the Transylvanians is Apafalva, the original seat of the Apasian princes, who governed all Transylvania from 1661 to 1713.

DOBREE, PETER PAUL, was born in the island of Guernsey in the year 1782. At an early age he was sent to Dr. Valpy's school at Reading, and stayed there till he became an undergraduate of Trinity College in the year 1800. He took his B. A. degree in 1804. He was a candidate for the chancellor's medals, but did not obtain either, having been, it is said, prevented by ill health from doing himself justice in the examination. After being elected a fellow of his college, he continued to reside at Cambridge, devoting himself to classical studies, and enjoying the intimacy of Porson, to whom he was devotedly attached, and from whom he derived all the spirit of his scholarship. After Porson's death, the books and MSS. of that great critic were purchased by Trinity College, and the task of editing part of Porson's notes was intrusted to Dobree: he was prevented, however, by illness, a subsequent journey to Spain, and other causes, from publishing the portion of these remains assigned to him till 1820, when he brought out an edition of the Plutus and of all that Porson had left upon Aristophanes, along with some learned notes of his own. In 1822 he published Porson's transcript of the lexicon of Photius. In the following year he was elected Regius professor of Greek. He died on the 24th September, 1825. He was engaged on an edition of Demosthenes at the time of his death: his notes on this and other Greek and Latin authors were collected and published by his successor in 1831. Some of his remarks are very acute, and some of his conjectures most ingenious, but it may be doubted if his friends have consulted his reputation in publishing a number of crude observations, the greater part of which were certainly never intended for the press. As a scholar, Dobree was accurate and fastidious he had some taste, and much common sense, which preserved him from committing blunders. His unwearying industry supplied him with a vast induction of particular observations; but he was unwilling, perhaps unable, to generalise; and on the whole, it must be allowed that he has neither done nor shown a power of doing any thing to justify the extravagant encomiums of some of his friends.

DOCK, the common name of many perennial tap-rooted species of the genus Rumex. They do not multiply by division of the root, but their seeds are dispersed in such abundance that they become a serious nuisance in cultivated land if they are not extirpated. The only two methods of doing this, are either by tearing or digging them up, which is so slow as scarcely to be adopted in practical husbandry, or by constantly hoeing up their young shoots; by the latter means they usually may be destroyed in a single summer.

DOCK, a place artificially formed for the reception of ships, the entrance of which is generally closed by gates. There are two kinds of docks, dry-docks and wet-docks. The former are used for receiving ships in order to their being inspected and repaired. For this purpose the dock must be so contrived that the water may be admitted or excluded at pleasure, so that a vessel can be floated in when the tide is high, and that the water may run out with the fall of the tide, or be pumped out, the closing of the gates preventing its return. Wet-docks are formed for the purpose of keeping vessels always afloat. The name of dock has sometimes been applied to an excavation from which the water, or a considerable part of it, runs in and out with the tide; but such an excavation is more properly an artificial basin or harbour than a dock. One of the chief uses of a dock is to keep a uniform level of water, so that the business of loading and unloading ships can be carried on without any interruption. Dock yards belonging to the government usually consist of dry docks for repairing ships, and of slips on which new vessels are built; besides which they comprise storehouses, in which various kinds of naval stores are kept and workshops in which different processes subsidiary to ship building are carried on. For some account of the great Dock yards of this kingdom the articles CHATHAM, DEVONPORT, PORTSMOUTH, and PLYMOUTH may be consulted.

The first wet-dock for commercial purposes made in this kingdom was formed in the year 1708 at Liverpool, then a place of no importance. It has been usual to ascribe to the amount of accommodation for shipping which has since been provided at this port a great part of the prosperity which it exhibits at the present day. That the docks at Liverpool have been and are of immense importance to the trade of the town, and extremely profitable to the corporation to which they belong, cannot be disputed, and that the progress of the trade of Liverpool has been accelerated by these means is highly probable; but that progress seems necessarily to have followed from the extraordinary growth of the manufactures in Lancashire; and as Liverpool is the natural outlet for the export trade of that part of the kingdom, we may suppose that the improvements in question have arisen out of the demands and necessities of commerce rather than that they have been the cause in any considerable degree of the trade itself. The Liverpool docks have been exceedingly profitable in proportion to the money expended on their construction. This expense has been much less than such works in general require, the labour of excavating having been in a great measure saved in consequence of their area having been inclosed from the river. For the same reason, the corporation of the town, to whom the docks belong, never had to make any outlay for the purchase of the land; and another great cause of expenditure which has occurred at other places has been avoided at Liverpool, where the docks are simply such, and are not provided with warehouses for storing goods. The dock first constructed, and which went by the name of "The Old Dock," was filled up a few years ago, and the site is now occupied by a very handsome custom-house, which is on the point of being completed (May 1837). Since the Old Dock was first made, others have been added at different periods, and at present the margin of the Mersey along the whole extent of the town is occupied by a series of eleven docks, without reckoning one constructed by the late Duke of Bridgewater as an auxiliary to his operations in internal navigation: this work, which is called "*The Duke's Dock,*" is now in possession of the Duke of Bridgewater's executors. The aggregate area of those docks which are the property of the corporation exceeds 100 acres.

The great advantage which the trade of Liverpool has progressively gained from the existence of these docks may be gathered from the following statement of the number of vessels by which they have been frequented in different years, taken at intervals, and by the amount of dues collected upon these vessels and the goods loaded and unloaded in and from the same.

Years.	Vessels.	Amount of Dock Dues.	Years.	Vessels.	Amount of Dock Dues.
1757	1,371	£2,336	1800	4,746	£2[illegible]
1760	1,245	2,330	1805	4,618	33,[illegible]
1765	1,930	3,455	1810	6,729	65,[illegible]
1770	2,073	1,142	1815	6,440	76,[illegible]
1775	2,291	5,384	1820	7,276	94,[illegible]
1780	2,261	3,528	1825	10,837	12[illegible]
1785	3,429	8,411	1830	11,214	151,[illegible]
1790	4,223	10,037	1835	14,959	244,[illegible]
1795	3,948	9,368			

An act of Parliament was passed in 1825 vesting the management of the Docks in a committee of 21 members, of whom 13 are nominated by the corporation of Liverpool, and 8 are elected out of their own body by the merchants who pay each at least 10*l*. a year in rates.

The first commercial wet-dock constructed in the port of London was for the accommodation of vessels employed in the Greenland whale-fishery, and was provided with the necessary apparatus for boiling the blubber. This branch of trade having almost entirely left the port of London, the dock was, about 30 years ago, opened for the reception of vessels employed in the European timber and corn trades, and with a view to the latter, a range of granaries was built. This dock, which is now known as the 'Commercial Dock,' is situated at Rotherhithe; it occupies altogether 49 acres, about four-fifths of which are water. The warehouses are not built so as to entitle them to be considered 'places of special security,' as described in the warehousing act, and many descriptions of goods are consequently not permitted to be deposited in them under bond.

Up to the end of the last century all ships arriving in London, with the exception already mentioned of the Greenland whale-ships, discharged their cargoes into lighters in the river. The continually increasing inconvenience thus occasioned by the growing trade of the port was much aggravated during a time of war, by the circumstance of the West India ships arriving together in great numbers under convoy. To remedy this inconvenience, a plan was projected in 1793 for constructing wet-docks for the reception of ships employed in the West India trade; but it was not until 1799 that the scheme was sanctioned by Parliament, and that an act was passed incorporating a company for the purpose, with a capital or joint-stock of 1,200,000*l.* The docks constructed under this act of incorporation are known as the West India Docks, and extend across the piece of land called the Isle of Dogs, which lies in a bend of the Thames between Blackwall and Limehouse, at both of which places there are entrances to the docks. Their construction was begun in February 1800, and was prosecuted so vigorously that in two years and a half from that time the works were sufficiently advanced to admit vessels for unloading. These docks consisted at first of two separate basins, one of which was used for discharging, and the other for loading ships. The import dock, which is situated to the north, is 870 yards long and 166 yards wide; the export dock is of the same length and 135 yards wide, so that the area of the two is equal to 54 acres; there are besides two basins, one at each entrance, that at Blackwall being 5 acres, and that at Limehouse 2 acres in extent. These two docks are together capable of accommodating more than 500 sail of merchant vessels of large size, and during the war, when ships arrived from the Colonies in large fleets, the accommodation was at times found to be not greater than was required. The import dock is surrounded by ranges of commodious warehouses. The city canal, which was cut parallel with the West India Docks on the south, was intended to form a short cut for ships, to enable them to avoid the circuit of the Isle of Dogs, but being very little used, was purchased about four years ago by the West India Dock Company, and a communication was made between it and the other basins.

The London Docks, which are situated at Wapping, were begun in the year 1801, and opened for business in 1805; they consist of the western dock of 20 acres, the eastern dock of 7 acres, and the tobacco dock, between the other two, of more than one acre. The space included within the dock walls exceeds 71 acres. The warehouses are spacious, and very substantially built. The tobacco warehouse, which is on the south side of the tobacco-dock, covers nearly five acres. The vaults beneath the warehouses contain space enough for stowing 66,000 pipes and puncheons of wine and spirits. One of the vaults has an area of 7 acres. A great part of the expense attending upon the construction of these docks was owing to the value of the houses and other property by which the site was previously occupied, and by the compensation which the Dock Company was bound by its act of incorporation to pay to lightermen, owners of warehouses in the City of London, and others whose business would probably suffer from the establishing of the docks. The joint-stock of the company is 3,238,000*l.*, in addition to which 700,000*l.* have been borrowed and expended. The amount of business carried on has been very great from the first opening of these docks, but the proprietors do not receive more than 2½ per cent. per annum on their stock.

The East India Docks, intended for the reception of ships employed by the East India Company, are situated at Blackwall, below the entrance to the West India Docks. There are two docks, one for unloading, the other for loading ships, of the area of 18 and 9 acres respectively; the entrance basin, which is common to both docks, is about 3 acres in extent; the cost of this undertaking was about 500,000*l.*: it has not hitherto proved profitable to the undertakers.

The East Country Dock adjoins the Commercial Dock to the south. It is frequented by vessels employed in the European timber trade. This dock, which was constructed in 1807, has an area of about 6½ acres. The basin at the entrance of the Surrey canal at Rotherhithe is also used as a dock.

The projecting of the St. Katherine's Docks arose out of an alleged want of sufficient accommodation in the London Docks. The act incorporating the St. Katherine's Dock Company was passed in 1825, and the Docks, which are situated between the London Docks and the Tower, were partially opened for business in October 1828. The joint-stock of the company amounts to 1,352,000*l.*, besides which 800,000*l.* of borrowed money have been spent. The outer wall incloses an area of 24 acres, of which 11 acres are water, the remainder being occupied by quays and warehouses. There are two docks, each capable of receiving vessels of 800 tons burthen, and which are frequented by ships in the East India, the North American, and South American trades. The warehouses are very commodious, and so contrived that goods are taken into them at once from the ship.

The wet dock at Bristol, which is of a character different from those of Liverpool and London, has already been described. [BRISTOL.]

At Hull there are three docks, occupying together an area of 26 acres, and capable of affording accommodation to more than 300 ships; but this amount is found to be insufficient for the increasing trade of the port, and a public meeting was lately held in the town to consider of the steps necessary to be taken for providing more dock room. The new port of Goole, situated near the junction of the Ouse with the Humber, has two wet-docks, one of which is calculated for the reception of sea-going vessels of considerable burthen, and the other is used for the accommodation of small craft which navigate the rivers and canals.

Leith has two wet-docks, extending together over 10 acres, and capable of accommodating 150 vessels of the size which at the time of the works being performed usually frequented the port. Since then, the introduction of steam navigation has made an entire change in the wants and uses of Leith as a harbour. The entrance to the docks is not sufficiently wide to admit the large steam vessels trading between London and Edinburgh, which must consequently discharge and load in the harbour, where they take the ground every tide, which is very objectionable, or they must lie at anchor in the Frith of Forth, and load and unload by means of boats, which is expensive and sometimes difficult, and even dangerous. The deficient state of accommodation here described was investigated by a committee of the House of Commons in 1835, but the insolvent condition of the corporation of Edinburgh, in which body is vested the property of the harbour and shore of Leith and its neighbourhood, has hitherto prevented the commencement of any improvement.

DOCLEA. [MAIADÆ.]

DOCTOR, one that has taken the highest degree in the faculties of Divinity, Law, Physic, or Music. In its original import it means a person so skilled in his particular art or science as to be qualified to teach it.

There is much difference of opinion as to the time when the title of Doctor was first created. It seems to have been established for the professors of the Roman law in the University of Bologna, about the middle of the twelfth century. Antony à Wood says, that the title of Doctor in Divinity began at Paris after Peter Lombard had compiled his Sentences, about the year 1151. (*Hist. and Antiq. Univ. of Oxford*, 4to. Oxf. 1792, vol. i. p. 62.) Previously, those who had proceeded in the faculties had been termed Masters only. The title of Doctor was not adopted in the English Universities earlier than the time of John or Henry the Third.

Wood cites several instances of the expense and magnificence which attended the early granting of the higher degrees in England in the reigns of Henry III. and Edward I. About the year 1268, he says, when Alphonsus de Senis, or Sienna, an Italian, studied at Oxford, one Bonifacius de Saluciis proceeded in the civil law, at whose inception there were such ceremonies and feasting, that the like for that faculty was scarce before known here. The abbot and convent of Oseney gave him the free use of their monastery on that occasion. He adds, that a still greater solemnity was performed some years after, at Gloucester College, by the Benedictines, for one William de Brooke, a monk of St. Peter's Monastery at Gloucester, who took the degree of D.D. in 1298, being the first of his Order who had attained that dignity. He was accompanied by the abbot and whole convent of his own monastery, the abbots of Westminster, Reading, Abingdon, Evesham, and Malmesbury, numerous other priors and monks, and by a hundred noblemen and esquires on horses richly caparisoned. (Wood, ut supr. pp. 65, 66.)

In Oxford the time requisite for the Doctor of Divinity's degree, subsequent to that of M.A., is eleven years; for a Doctor's of Civil Law, five years from the time at which the Bachelor of Laws' degree was conferred. Those who take this degree professionally, in order to practise in Doctors' Commons, are indulged with a shorter period, and permitted to obtain it at four instead of five years, upon making oath in convocation of their intentions so to practise. For the de gree of M.D., three years must intervene from the time of the candidate's having taken his Bachelor of Medicine's degree. For a Doctor's degree in Divinity or Law three distinct lectures are to be read in the schools, upon three different days: but by a dispensation, first obtained in convocation or congregation, all three are permitted to be read upon the same day; so that by dispensation a single day is sufficient in point of time for these exercises. For a Doctor's degree in Medicine, a dissertation upon some subject, to be approved by the Professor of Medicine, must be publicly recited in the schools, and a copy of it afterwards delivered to the Professor.

In Cambridge a Doctor of Divinity must be a Bachelor of Divinity of five, or a M.A. of twelve years' standing. The requisite exercises are one act, two opponencies, a Latin sermon, and an English sermon. A Doctor of Laws must be a Bachelor of Laws of five years' standing. His exercises are one act and one opponency. Doctors of Physic proceed in the same manner as Doctors of Laws. For a Doctor's degree in music, in both Universities, the exercise required is the composition and performance of a solemn piece of music, to be approved by the Professor of the Faculty. (See the *Oxf. and Camb. Calendars for* 1837.)

Coloured engravings of the dresses worn by the doctors of the several faculties of Oxford and Cambridge will be found in Ackermann's *History of the Univ. of Oxford*, 4to., 1814, vol. ii. p. 259, *et seq.*; and in his *History of the Univ. of Cambridge*, 4to., 1815, vol. ii. p. 312, *et seq.*

DOCTORS' COMMONS, the College of Civilians in London, near St. Paul's Churchyard, founded by Dr. Harvey, Dean of the Arches, for the professors of the civil law. The official residences of the judges of the Arches' Court of Canterbury, of the judge of the Admiralty, and the judge of the Prerogative Court of Canterbury, are situated there. It is also the residence of the doctors of the civil law practising in London, who live there (for diet and lodging) in a collegiate manner, and common together, and hence the place is known by the name of Doctors' Commons. It was burnt down in the fire of London, and rebuilt at the charge of the profession. (*Chambral Mag. Brit. Notitia.*) To this college belong a certain number of proctors, who manage causes for their clients, &c.

In the Common Hall are held all the principal spiritual courts, and the High Court of Admiralty.

DODDER. [CUSCUTACEÆ.]

DODDRIDGE, PHILIP, D.D. (birth in 1702, and death in 1751), a dissenting divine, who, on account of his singularly amiable disposition and manners, his ministerial assiduity, piety, and learning, is regarded as one of the ornaments of the religious community to which he belonged.

The community of which we speak is that of the Old Dissenters of England; those who adhered to the clergy who left the church when the Act of Uniformity, passed in 1662, soon after the return of Charles II. from exile, prescribed the terms of ministerial conformity. These persons formed a numerous and powerful party during the whole of that reign, and at length succeeded, though after much suffering, in enforcing their right to have their meeting-houses protected by law, and themselves allowed to assemble under the same protection which was extended to ministers and people who were willing to conform under that act. This right however was not recognised till after the revolution. The act of parliament which gave it is called the Act of Toleration, and was one of the first legislative measures of the new government, being passed in 1689.

The effect of it was, that the non-conforming or dissenting body became cast into societies, each with its own place of worship, where the usual ordinances of Christianity were administered, each having also its own pastor, who was either a minister who had been silenced by the act of 1662, or a minister who had been trained under those ministers and ordained by them.

Doddridge was born in one of these families living in London, where he had the early part of his education. He was [illegible] for a time at St. Albans, where lived a minister, Mr. [illegible] who was a great friend and indeed patron, for the [illegible] had died while he was young, and had left [illegible] of his education. It was early perceived [illegible] mind peculiarly pointed to the profession [illegible] and he was entered at a dissenting [illegible] Mr. John Jennings presided, the son [illegible] ejected in 1662. This academy was [illegible] Kibworth in Leicestershire. Dr. Doddridge entered it in 1718 or 1719, and in 1722 commenced his ministry at Kibworth, his late tutor Mr. Jennings removing in that year to Hinckley, where he died in the succeeding year.

The death of Mr. Jennings was an important event in the history of Dr. Doddridge. Great expectations had been formed among the Dissenters of the success of Mr. Jennings in the education of ministers, and it was thought a point of importance to maintain an academy of that kind in one of the central counties. Mr. Jennings had mentioned his pupil Doddridge as being a person whom he thought eminently qualified to carry on the work, and the eyes of the Dissenters were generally directed to him as the person best qualified to do so.

However, several years passed, during which Doddridge was leading the life of a non-conformist minister, his services being divided between the people who attended the chapel at Kibworth, and the congregation at the neighbouring town of Market Harborough. He was diligent in his ministry both in public and private, but he found time also for much theological reading, by which means he qualified himself the better for the office which he and his friends had ever kept in view.

In 1729 he began his academy, which soon attained a high reputation. It was the institution in which most of the more distinguished ministers of the Old Dissenters in the middle of the eighteenth century were educated. It was first established at Market Harborough, where he at the time resided; but before the end of the year he removed to Northampton, having been invited to become the minister of the Dissenting congregation in that town; and at Northampton he continued both as pastor of the Dissenting congregation, and head of the Dissenting academy, till his death. He died at Lisbon thirteen days after his arrival. He had gone thither with little hope of recovery.

Doddridge lived at a time when the zeal of the class of persons to whom he belonged had lost some part of its ancient fervour. This he saw with regret, and was very desirous to revive it. This appears to have been a principal object, and one kept steadily in view both in his ministerial labours and his published writings. His printed sermons are remarkable for the earnestness with which he presses the great importance of a religious life, the evil of spiritual indifference or carelessness, and the indispensable necessity of uniting with the practice of the moral duties the cultivation of the spirit of piety, and a deep and serious regard to the momentous truths of religion. This appears particularly in a book of his which has been popular both at home and abroad, entitled 'The Rise and Progress of Religion in the Soul.' There is the same spirit of animated piety, and occasionally touches of genuine eloquence, in the practical part of another publication of his entitled 'The Family Expositor,' in which we have the whole Scriptures of the New Testament, (the gospels being in a harmony,) with a paraphrase, a series of critical notes, and reflections, or, as he calls them, improvements of each section into which the whole is divided. This work has also been often printed, and it may be regarded as an evidence of his learning as well as of his piety; the notes abound with critical remarks, gathered out of numerous authors, or suggestions of his own mind, full of that knowledge which fits a man to illustrate those difficult writings. The course of metaphysical, ethical, and theological lectures, through which he conducted the young men who were trained by him for the christian ministry was published after his death, and is an excellent text-book of systematic divinity, and (especially in the later edition by Dr. Kippis, in 2 vols. 8vo.) a very useful body of references to writers on almost every [illegible] under the heads of metaphysics, ethics, or divinity. Nor must it be omitted that to him the Dissenters owe some of the best hymns which are sung by them in their public services.

Thus living a life of activity and usefulness, practising the virtues which he taught to others, and exhibiting a [illegible] spirit of an unaustere piety, he lived greatly respected by many eminent persons beyond the pale of his own religious community, and in that community his death at so early an age was felt to be a great and general misfortune. His name is still never mentioned among them but with honour.

Two large accounts of his life have been published. The first by Job Orton, another divine of a kindred spirit, who belonged to the same community: the second by Dr. Kippis, a pupil of Dr. Doddridge, and also a minister, who has introduced it in the 'Biographia Britannica,' of which he was the editor. The reader may see in these works all the detail of his public labours, his principles and plan of conducting, and will easily understand from them the influence of his character on the body to which he belonged. One of his descendants has within the last few years given to the world a very large collection of his correspondence and private papers. In these we see his inmost mind.

DODECAGON, a figure of twelve sides; a term generally applied to an equiangular and equilateral (or regular) dodecagon.

The side of a regular dodecagon inscribed in a circle is ·5176381 of the radius, and of that about a circle ·5358984 of the radius. Similarly the radii of the circles inscribed in and circumscribed about a dodecagon are 1·8660254 and 1·9318517 of the side. The area of a dodecagon is three times the square of the radius of the circumscribed circle, or 11·1961524 of the square on the side.

DODECAGY'NIA, the name of any order in the Linnæan classification of plants wherein the number of styles is twelve.

DODECAHE'DRON. [Solids, Regular.]

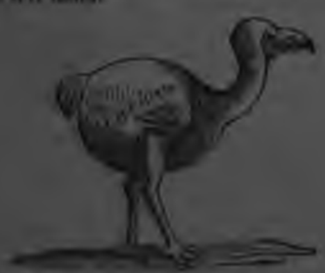
DODECA'NDRIA, the twelfth class in the Linnæan classification of plants. It contains species having twelve or about twelve stamens, provided they do not adhere by their filaments.

DODO, DIDUS, a genus of birds generally supposed to be extinct, and whose very existence has been doubted. We have taken some pains to collect the evidence on this subject, and we here present it to our readers.

WRITTEN AND PICTORIAL EVIDENCE.

It appears that Vasco de Gama, after having doubled the Cape of Good Hope (Cabo Tormentoso, or Cape of Storms) in 1497, discovered, at sixty leagues beyond it, a bay, Angra de San Blas, near an isle, where he saw a very great number of birds of the form of a goose, but with wings like those of the bats, which the sailors called solitaries. On their return, in 1498, the Portuguese touched again at San Blas, where they took a great number of these birds, and comparing them to swans, called the island 'Ilha dos Cysnes,' Isle of Swans.* In the voyage to the East Indies in 1598, by Jacob Van Neck and Wybrand van Warwijk (small 4to, Amsterdam, 1646,) there is a description of the *Walgh-vogels* in the island of Cerne, now called Mauritius, as being as large as our swans, with large heads, and a kind of hood thereon; no wings, but, in place of them, three or four black little pens (pennekens), and their tails consisting of four or five curled plumelets (pluymkens) of a greyish colour. The breast is spoken of as very good, but it is stated that the voyagers preferred some turtle-doves that they found there. The bird appears with a tortoise near it, in a small engraving, one of six which form the prefixed plate.

In the frontispiece to De Bry (Quinta Pars Indiæ Orientalis, &c., M.DCI), surmounting the architectural design of the title-page will be found, we believe, the earliest engravings of the Dodo. A pair of these birds stand on the cornice on each side, and the following cut is taken from the figure on the left hand.



In De Bry's 'Descriptio Insulæ Do Cerne a nobis Mauritius dictæ' is the following account: 'Licentious parrots also are there in great numbers, as well as other birds; besides which there is another larger kind, greater than our swans, with vast heads, and one half covered with a skin, as it were, hooded. These birds are without wings, in the place of which are three or four rather black feathers (quarum loco tres quatuorve pennæ nigriores prodeunt). A few curved delicate ash-coloured feathers constitute the tail. These birds we called *Walck-Vögel*, because the longer they were cooked the more unfit for food they became (quo longius enim diutius elixabantur, plus lentescebant et erant insuavius). Their bellies and breasts were nevertheless of a pleasant flavour (ingenii jucundi) and easy of mastication. Another cause for the appellation we gave them was the preferable abundance of turtle-doves which were of a far sweeter and more grateful flavour.' It will be observed that the bill in De Bry's figure is comparatively small.

Clusius, in his 'Exotics' (1605), gives a figure, here copied, which, he says, he takes from a rough sketch in a journal of a Dutch voyager who had seen the bird in a voyage to the Moluccas in the year 1598.

The following is Willughby's translation of Clusius, and the section is thus headed: 'The Dodo, called by Clusius *Gallus gallinaceus peregrinus*, by Nierembergius *Cygnus cucullatus*, by Bontius *Dronte*.' 'This exotic bird, found by the *Hollanders* in the island called Cygnea or Cerne (that is the Swan Island) by the Portuguese, Mauritius Island by the Low Dutch, of thirty miles' compass, famous especially for black ebony, did equal or exceed a swan in bigness, but was of a far different shape; for its head was great, covered as it were with a certain membrane resembling a hood: beside, its bill was not flat and broad, but thick and long; of a yellowish colour next the head, the point being black. The upper chap was hooked; in the nether had a bluish spot in the middle between the yellow and black part. They reported that it is covered with thin and short feathers, and wants wings, instead whereof it hath only four or five long black feathers; that the hinder part of the body is very fat and fleshy, wherein for the tail were four or five small curled feathers, twisted up together, of an ash-colour. Its legs are thick rather than long, whose upper part, as far as the knee, is covered with black feathers; the lower part, together with the feet, of a yellowish colour: its feet divided into four toes, three (and those the longer) standing forward, the fourth and shortest backward: all furnished with black claws. After I had composed and writ down the history of this bird with as much diligence and faithfulness as I could, I happened to see in the house of Peter Pauwius, primary professor of physic in the university of Leyden, a leg thereof cut off at the knee, lately brought over out of Mauritius his island. It was not very long, from the knee to the bending of the foot being but little more than four inches, but of a great thickness, so that it was almost four inches in compass, and covered with thick-set scales, on the upper side broader, and of a yellowish colour, on the under (or backside of the leg) lesser and dusky. The upper side of the toes was also covered with broad scales, the under side wholly callous. The toes were short for so thick a leg; for the length of the greatest or middlemost toe to the nail did not much exceed two inches; that of the other toes next to it scarce came up to two inches; the back-toe fell something short of an inch and a half; but the claws of all were thick, hard, black, less than an inch long; but that of the back-toe longer than the rest, exceeding an inch.* The mariners, in their dialect, gave this bird the name *Walgh-Vogel*, that is, a nauseous or yellowish† bird; partly because after long boiling its flesh became not tender, but continued hard and of a difficult concoction, excepting the breast and gizzard, which they found to be of no bad relish, partly because they could easily get many *turtle-doves*, which were much more delicate and pleasant to the palate. Wherefore it was no wonder that in comparison of these they despised this, and said they could be well content without it. Moreover they said that they found certain stones in its gizzard, *and no wonder, for all other birds, as well as these, swallow stones, to assist them in grinding their meat.*' Thus far Clusius.'

In the voyage of Jacob Heemskerk and Wolfert Harmansz to the East Indies, in 1601, 1602, 1603 (small 4to, Amsterdam, 1646), folio 19, the Dod-aarsen (Dodos) are enumerated among the birds of the island of 'Cerne, now Mauritius;' and in the 'Journal of the East Indian Voyage of Willem Ysbrantsz Bontekoe van Hoorn, comprising many wonderful and perilous things that happened to him'—from 1618 to 1625 (small 4to., Utrecht, 1649)—under the head of the 'Island of Mauritius or Maskarinas,' mention is made (page 6) of the *Dod-eersen*, which had small wings, but could not fly, and were so fat that they scarcely could go.

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* It is stated ([illegible], vol. ii. p. [illegible]) that the island of Mauritius was discovered by the Portuguese navigator, Mascarenhas, in [illegible], and [illegible] the name of Mascarenhas or Mascaregne.

* We are indebted to Mr. Gray for the following measurement of the foot in the British Museum:—'Knee to scale 4½ inches; circumference 4 inches; middle toe 2 inches; back toe 1½ inch; front claws, which are much worn, 4 lines; back claw, also much worn, shorter.' Mr. Gray observes that the leg mentioned by Clusius is probably, from the similarity of the measurement, the specimen which was afterwards noticed by Grew, and finally came to the British Museum.

† So in Willughby, but the print is somewhat indistinct, and there may be error. In the original the words are '*Walgh-Vogel*,' hoc est, [illegible] avis, partim quod, &c.; the word therefore is an interpolation.

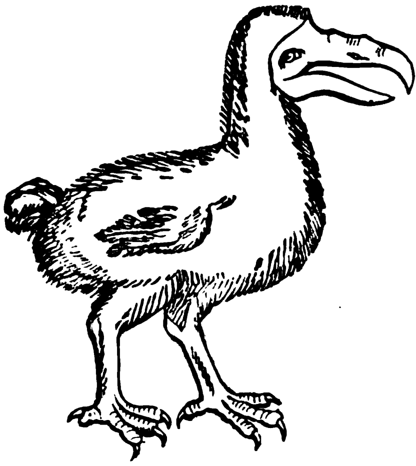
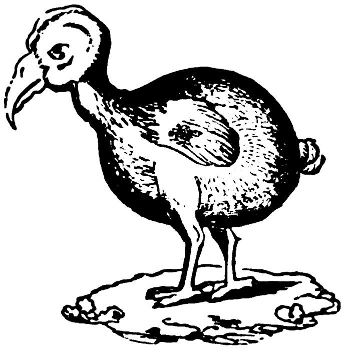


Figure from Clusius.

Herbert, in his Travels (1634), gives a figure or rather figures of a bird that he calls 'Dodo,' and the following account:—'The Dodo comes first to our description, here, and in Dygarrois (and no where else, that ever I could see or heare of, is generated the Dodo). (A Portuguize name it is, and has reference to her simplenes), a bird which for shape and rarenesse might be called a Phœnix (wer't in Arabia); her body is round and extreame fat, her slow pace begets that corpulencie; few of them weigh lesse than fifty pound: better to the eye than the stomack: greasie appetites may perhaps commend them, but to the indifferently curious nourishment, but prove offensive. Let's take her picture: her visage darts forth melancholy, as sensible of nature's injurie in framing so great and massie a body to be directed by such small and complementall wings, as are unable to hoise her from the ground, serving only to prove her a bird; which otherwise might be doubted of: her head is variously drest, the one halfe hooded with downy blackish feathers; the other perfectly naked; of a whitish hue, as if a transparent lawne had covered it: her bill is very howked and bends downwards, the thrill or breathing place is in the midst of it; from which part to the end, the colour is a light greene mixt with a pale yellow; her eyes be round and small, and bright as diamonds; her cloathing is of finest downe, such as you see in goslins; her trayne is (like a China beard) of three or foure short feathers; her legs thick, and black, and strong; her tallons or pounces sharp; her stomack fiery hot, so as stones and iron are easily digested in it; in that and shape, not a little resembling the Africk oestriches: but so much, as for their more certain difference I dare to give thee (with two others) her representation.'—(4th ed., 1677.)



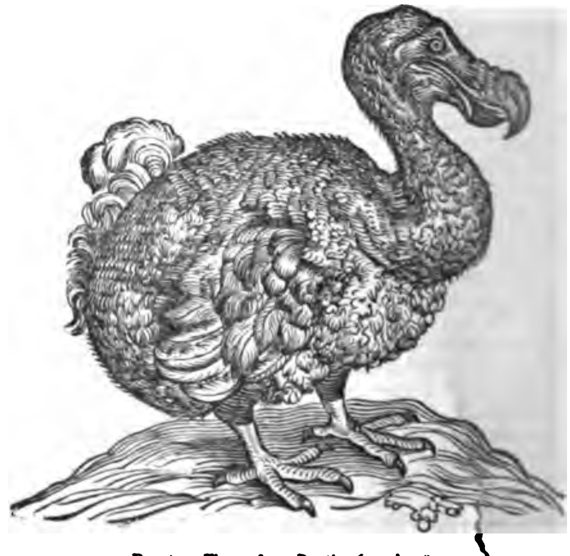
Herbert's figure.

Nierembergʼs description (1655) may be considered a copy of that of Clusius, and indeed his whole work is a mere compilation. As we have seen above, he names the bird *Cygnus cucullatus.*

In Tradescant's catalogue ('*Musæum Tradescantianum*, or, a Collection of Rarities preserved at South Lambeth, near London, by John Tradescant,' London, 1656, 12mo.), we find among the 'Whole Birds'—'Dodar, from the island Mauritius; it is not able to flie being so big.' That it was a Dodo there can be no doubt; for we have the testimony of an eye-witness, whose ornithological competence cannot be doubted, in the affirmative. Willughby at the end of his section on 'The Dodo,' and immediately beneath his translation of Bontius, has the following words: 'We have seen this bird dried, or its skin stuft in Tradescant's cabinet.' We shall, hereafter, trace this specimen to Oxford.

Jonston (1657) repeats the figure of Clusius, and refers to his description and that of Herbert.

Bontius, edited by Piso (1658), writes as follows: '*De Dronte*, aliis *Dod-aers*.' After stating that among the islands of the East Indies is that which is called *Cerne* by some, but Mauritius 'a nostratibus,' especially celebrated for its ebony, and that in the said island a bird 'miræ conformationis' called *Dronte* abounds, he proceeds to tell us—we take Willughby's translation—that it is 'for bigness of mean size between an ostrich and a turkey, from which it partly differs in shape, and partly agrees with them, especially with the African ostriches, if you consider the rump, quills, and feathers: so that it was like a pigmy among them, if you regard the shortness of its legs. It hath a great, ill-favoured head, covered with a kind of membrane resembling a hood; great black eyes; a bending, prominent fat neck; an extraordinary long, strong, bluish-white bill, only the ends of each mandible are of a different colour, that of the upper black, that of the nether yellowish, both sharp-pointed and crooked. It gapes huge wide as being naturally very voracious. Its body is fat, round, covered with soft grey feathers, after the manner of an *ostriches*: on each side instead of hard wing-feathers or quills, it is furnished with small, soft-feathered wings, of a yellowish ash-colour; and behind, the rump, instead of a tail, is adorned with five small curled feathers of the same colour. It hath yellow legs, thick, but very short; four toes in each foot, solid, long, as it were scaly, armed with strong, black claws. It is a slow-paced and stupid bird, and which easily becomes a prey to the fowlers. The flesh, especially of the breast, is fat, esculent, and so copious, that three or four *Dodos* will sometimes suffice to fill an hundred seamens' bellies. If they be old, or not well boiled, they are of difficult concoction, and are salted and stored up for provision of victuals. There are found in their stomachs stones of an ash colour, of divers figures and magnitudes; yet not bred there, as the common people and seamen fancy, but swallowed by the bird; as though by this mark also nature would manifest that these fowl are of the *ostrich* kind, in that they swallow any hard things, though they do not digest them.'



Dronte. Figure from Bontius (wood-cut).

There is also a figure of the bird in the frontispiece, a copper-plate engraving.

It appears from Adam Olearius (Die Gottorfische Kunst Kammer, 1666), that there was a head to be seen in the Gottorf Museum; but the figure (Tab. xiii. f. 5) is very like that of Clusius. It is mentioned as the head of the *Walch-Vogel* and Clusius is referred to. In the plate the head is shaded, and has a more finished appearance: the rest of the bird is in outline.

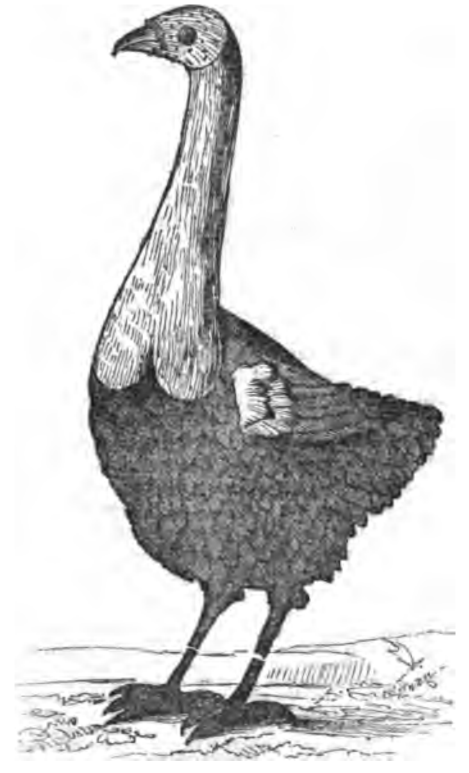
Grew (' Musæum Regalis Societatis; or a catalogue and description of the natural and artificial rarities belonging to the Royal Society,' London, folio, 1681), at p. 68, thus describes the bird which is the subject of our inquiry. '*The leg of a Dodo;* called *Cygnus cucullatus* by Nierembergius; by Clusius, *Gallus gallinaceus peregrinus;* by Bontius called *Dronte*, who saith that by some it is called (in Dutch) *Dod-aers*, largely described in Mr. Willughby's Ornithol. out of Clusius and others. He is more especially distinguished from other birds by the membranous hood on his head, the greatness and strength of his bill, the littleness of his wings, his bunchy tail, and the shortness of his legs. Abating his head and legs, he seems to be much like an ostrich, to which also he comes near as to the bigness of his body. He breeds in Mauris's Island. The leg here preserved is covered with a reddish-yellow scale. Not much above four inches long, yet above five in thickness, or round about the joints, wherein, though it be inferior to that of an *Ostrich* or *Cassowary*, yet, joined with its shortness, may render it of almost equal strength.' At p. 73, there is the following notice:—'The head of the *Man of War*, called also *Albitrosse;* supposed by some to be the head of a *Dodo*, but it seems doubtful. That there is a bird called *the Man of War* is commonly known to our seamen; and several of them who have seen the head here preserved, do affirm it to be the head of that bird, which they describe to be a very great one, the wings whereof are eight feet over. And Ligon (*Hist. of Barbad.*, p. 61), speaking of him, saith, that he will commonly fly out to sea to see what ships are coming to land, and so return. Whereas the *Dodo* is hardly a volatile bird, having little or no wings, except such as those of the *Cassowary* and the *Ostrich*. Besides, although the upper beak of this bill doth much resemble that of the *Dodo*, yet the nether is of a quite different shape; so that this either is not the head of a *Dodo*, or else we have nowhere a true figure of it.' Grew then gives a very lengthened description of the skull which is figured by him (Tab. 6), and intituled '*Head of the Albitros*,' as it doubtless was. The leg above mentioned is that now preserved in the British Museum, where it was deposited with the other specimens described by Grew, when the Royal Society gave their 'rarities' to that national establishment. Grew was a well qualified observer, and much of this description implies observation and comparison; indeed, though he does not refer to it, there is no reason for supposing that Grew was not familiar with Tradescant's specimen.

Charleton also (Onomasticon, 1688) speaks of the *Dodo Lusitanorum, Cygnus cucullatus*, Willughby and Ray, and asserts that the Museum of the Royal Society of London contained a leg of the *Dodo*. This was evidently the leg above alluded to.

Leguat, in his description* of the Isle, 'which is called either Diego-Rodrigo, or Diego-Ruys, or Rodrigo,' gives the following account. 'We had also another creek on the other side of our cabbins, and full of oysters sticking to the rock. We went often to breakfast there, and brought some home, with which we made an excellent ragout with palm-tree-cabbages and turtle's fat. Of all the birds in the island, the most remarkable is that which goes by the name of the *Solitary* (*le Solitaire*), because it is very seldom seen in company, though there are abundance of them. The feathers of the males are of a brown-grey colour; the feet and beak are like a turkey's, but a little more crooked. They have scarce any tail, but their hind part covered with feathers is roundish, like the crupper of a horse; they are taller than turkeys. Their neck is straight, and a little longer in proportion than a turkey's when it lifts up its head. Its eye is black and lively, and its head without comb or cop. They never fly, their wings are too little to support the weight of their bodies; they serve only to beat themselves and flutter when they call one another. They will whirl about for twenty or thirty times together on the same side during the space of four or five minutes; the motion of their wings makes then a noise very like that of a rattle, and one may hear it two hundred paces off. The bone of their wing grows greater towards the extremity, and forms a little round mass under the feathers as big as a musket-ball: that and its beak are the chief defence of this bird. 'Tis very hard to catch it in the woods, but easy in open places, because we run faster than they, and sometimes we approach them without much trouble. From March to September they are extremely fat, and taste admirably well, especially while they are young; some of the males weigh forty-five pound.

'The females are wonderfully beautiful, some fair, some brown; I call them fair because they are of the colour of fair hair: they have a sort of peak, like a widow's, upon their breasts, which is of a dun colour. No one feather is straggling from the other all over their bodies, being very careful to adjust themselves and make them all even with their beaks. The feathers on their thighs are round like shells at the end, and being there very thick, have an agreeable effect: they have two risings on their *craws*, and the feathers are whiter there than the rest, which livelily represent the fine neck of a beautiful woman. They walk with so much stateliness and good grace, that one cannot help admiring them and loving them, by which means their fine mien often saves their lives.

'Though these birds will sometimes very familiarly come up near enough to one when we do not run after them, yet they will never grow tame: as soon as they are caught they shed tears without crying, and refuse all manner of sustenance till they die. We find in the gizzards of both male and female a brown stone, of the bigness of a hen's egg; it is somewhat rough, flat on one side, and round on the other, heavy and hard. We believe this stone was there when they were hatched, for let them be never so young, you meet with it always. They have never but one of them; and besides, the passage from the craw to the gizzard is so narrow, that a like mass of half the bigness could not pass. It served to whet our knives better than any other stone whatsoever. When these birds build their nests they choose a clean place, gather together some palm-leaves for that purpose, and heap them up a foot and a half high from the ground, on which they sit. They never lay but one egg, which is much bigger than that of a goose. The male and female both cover it in their turns, and the young is not hatched till at seven weeks' end: all the while they are sitting upon it, or are bringing up their young one,



Solitary Bird of Leguat.

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* 'A new voyage to the East Indies by Francis Leguat and his companions, containing their adventures in two Desert Islands, &c.,' 8vo., London, 708.

which is not able to provide for itself in several months, they will not suffer any other bird of their species to come within two hundred yards round of the place; but what is very singular is, the males will never drive away the females, only when he perceives one he makes a noise with his wings to call the female, and she drives the unwelcome stranger away, not leaving it till it is without her bounds. The female does the same as to the males, whom she leaves to the male, and he drives them away. We have observed this several times, and I affirm it to be true. The combats between them on this occasion last sometimes pretty long, because the stranger only turns about, and does not fly directly from the nest: however, the others do not forsake it till they have quite driven it out of their limits. After these birds have raised their young one, and left it to itself, they are always together, which the other birds are not; and though they happen to mingle with other birds of the same species, these two companions never disunite. We have often remarked, that some days after the young one leaves the nest, a company of thirty or forty brings another young one to it, and the new-fledged bird, with its father and mother joining with the band, march to some bye place. We frequently followed them, and found that afterwards the old ones went each their way alone, or in couples, and left the two young ones together, which we called a *marriage*. This particularity has something in it which looks a little fabulous; nevertheless, what I say is sincere truth, and what I have more than once observed with care and pleasure.' The worthy narrator then indulges in some reflections on marriages in general, and early marriages in particular. It is worthy of note, with reference to the alleged juxtaposition of the bones of a large land-turtle and those of the dodo, to which we shall have occasion to allude, that the same author, in the description of the same island, speaks of the multitude of land-turtles; of which he says, 'I have seen one that weighed one hundred pound, and had flesh enough about it to feed a good number of men.'

The preceding cut is copied from Leguat's figure of 'the Solitary Bird.'

In the frontispiece is represented one in a sort of landscape, and also land-turtles; and in 'a plan of the settlement' in the Island of Rodrigo, many, some in pairs, are placed about. This plan shows the situation of the houses, &c., of Leguat and his companions: there are also land-turtles and other animals.*

We now proceed to trace the specimen which was in the Musæum Tradescantianum. There were, it seems, three Tradescants, grandfather, father, and son. The two former are said to have been gardeners to Queen Elizabeth, and the latter to Charles I. There are two portraits to the 'Musæum,' one of 'Joannes Tradescantus pater' and the other of 'Joannes Tradescantus filius,' by Hollar. These two appear to have been the collectors: for John Tradescant, the son, writes in his address 'to the ingenious reader' that he 'was resolved to take a catalogue of those varieties and curiosities which my father had scedulously collected and my selfe with continued diligence have augmented, and hitherto preserved together.' This John Tradescant, the son, must have been the Tradescant with whom Elias Ashmole boarded for a summer when Ashmole agreed to purchase the collection, which was said to have been conveyed to Ashmole by deed of gift from Tradescant and his wife. Tradescant died soon after and Ashmole, in 1662, filed a bill in Chancery for a delivery of the curiosities. The cause is stated to have come to a hearing in 1664, and in 1674, Mrs. Tradescant delivered up the collection pursuant to a decree in Chancery, and afterwards (April, 1678, some say) was found drowned in her own pond. Ashmole added to the collection, and presented it to the University of Oxford, where it became the foundation of the Ashmolean Museum. That the entire 'Dodar' went to Oxford with the rest of Tradescant's curiosities there can be no doubt. Hyde (Religionis Veterum Persarum, &c., Historia, 1700) makes particular mention of it as existing in the Museum at Oxford. There, according to Mr. Dun it was destroyed in 1755 by order of the visitors, and he gives the evidence of its destruction:—

'In the Ashmolean Catalogue, made by Ed. Lhwyd. M sæi Procustos, 1684 (Plott being the keeper), the en the bird is "No. 29. Gallus gallinaceus peregrinus C &c." In a Catalogue made subsequently to 1755, it is st "That the numbers from 5 to 46, being decayed, ordered to be removed at a meeting of the majority of visitors, Jan. 8, 1755." Among these of course was incl the Dodo, its number being 29. This is further shown new Catalogue, completed in 1756, in which the order of visitors is recorded as follows: "Illa quibus nullus in gine assignatur numerus a Musæo subducta sunt cum annuentibus Vice-Cancellario aliisque Curatoribus ad lustranda convocatis, die Januarii 8vo., A.D. 1755." The D is one of those which are here without the number.' (D can *On the Dodo; Zool. Journ.*, vol. iii., p. 559.)

Upon this solemn sentence, which left to the Mu nothing but a foot and a head, Lyell makes the follow observation: 'Some have complained that inscriptions tomb-stones convey no general information, except tha dividuals were born and died, accidents which must hap alike to all men. But the death of a *species* is so rema able an event in natural history that it deserves commem ration; and it is with no small interest that we learn the archives of the University of Oxford, the exact day year, when the remains of the last specimen of the D which had been permitted to rot in the Ashmolean Muse were cast away:' and the author concludes by giving fatal record at length with becoming gravity.

We now come to the celebrated painting in the Bri Museum, a copy of which, by the kind assistance of officers of the zoological department, who have given every assistance in prosecuting this inquiry, and who ha taken down for the purpose, we present to our readers.

It has been stated that the painting came into the poss sion of Sir Hans Sloane, president of the Royal Society, that it was bought at his sale by Edwards, who, after p lishing a plate from it in his Gleanings, presented it to Royal Society, whence it passed, as well as the foot, into British Museum. But Mr. Gray informs us that foot only came with the museum of the Royal Society scribed by Grew; and that the picture was an especial from Edwards. Edwards's copy seems to have been m in 1760, and he himself says—'The original picture drawn in Holland from the living bird brought from Maurice's Island in the East Indies in the early times the discovery of the Indies by the way of the Cape of Hope. It was the property of the late Sir Hans Sloane the time of his death; and afterwards becoming my pr perty I deposited it in the British Museum as a great osity. The above history of the picture I had from Sir H Sloane and the late Dr. Mortimer, secretary to the Roy Society.'

M. Morel, Ecrivain Principal des Hôpitaux au P Louis de l' Isle de France, writes as follows in his p 'Sur les oiseaux monstrueux nommés Dronte, Dodo, C Capuchonné, Solitaire, et Oiseau de Nazare, et sur la Isle de Sable à 50 lieues environ de Madagascar.' 'T birds, so well described in the second volume of the His tory of Birds', by M. le Comte de Buffon, and of which M de Borame has also spoken in his 'Dictionary of Natu History,' under the names of Dronte, Dodo, Hooded S (Cygne Capuchonné), Solitary or Wild Turkey (Dinde vage) of Madagascar, have never been seen in the isle France, Bourbon, Rodriguez, or even the Seychelles discovered, during more than 60 years since when th places have been inhabited and visited by French colo The oldest inhabitants assure every one that these strous birds have been always unknown to them.' A some remarks that the Portuguese and Dutch who overran these islands may have seen some very large b such as Emeus or Cassowaries, &c., and described th each after his own manner of observing, M. Morel thus ceeds: 'However this may be, it is certain that for ne an age (depuis près un siècle) no one has here seen an mal of this species. But it is very probable that before islands were inhabited, people might have been able to some species of very large birds, heavy and incapab flight, and that the first mariners who sojourned there destroyed them from the facility with which they w caught. This was what made the Dutch sailors ca

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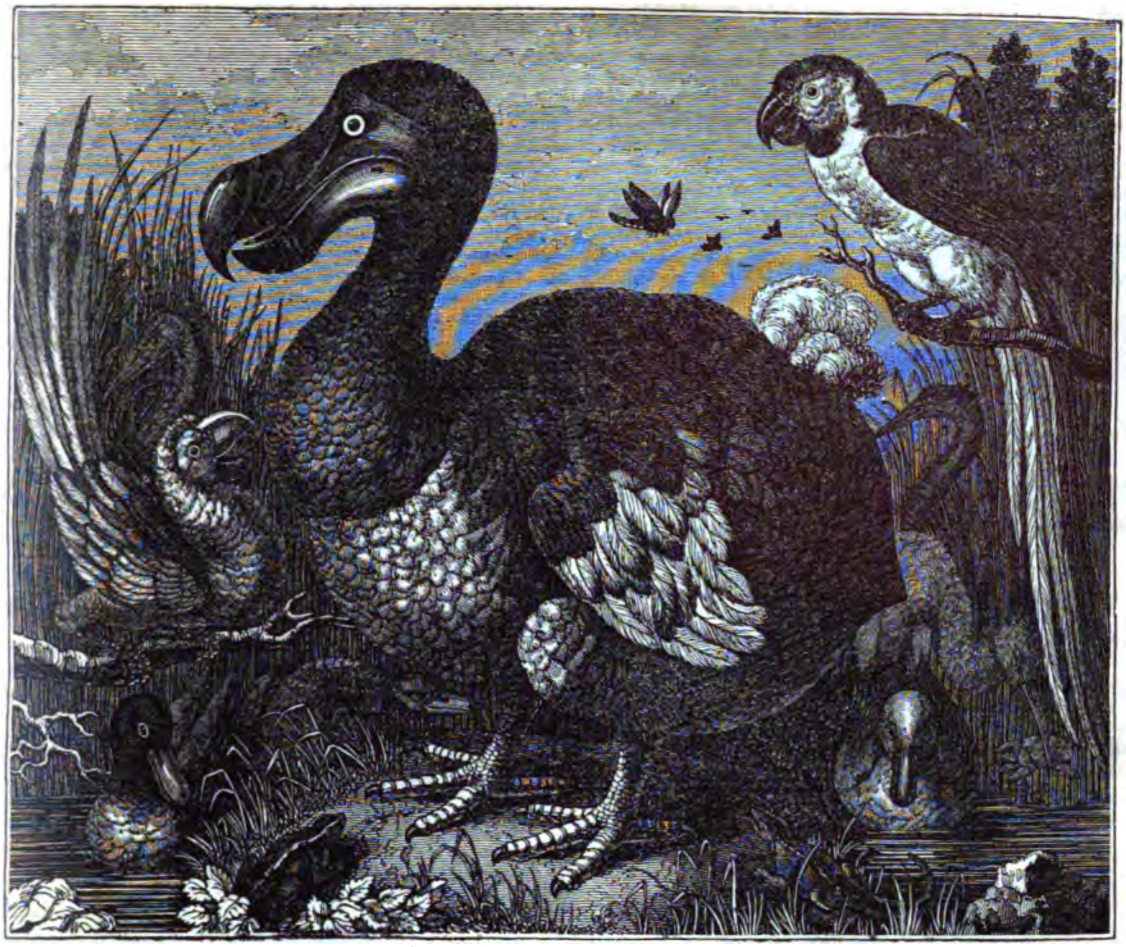
* Le premier auteur qui ait parlé du Solitaire paroît être Castelaton, dans le récit d'un voyage fait en 1614, et publié seulement en 1690. Il toucha à l'île de Bourbon, alors nommée Mascaraigne par les Portugais, et encore inhabitée quoique visitée depuis long-temps par les navigateurs. Parmi les oiseaux qu'il y remarqua, il en particularise une espèce de la grosseur d'une oie très grande, avec des ailes courtes qui ne lui permettoient pas de voler. Cet oiseau avoit été, dit-il, nommé jusque là le géant, et l'île de France en produit beaucoup: il est blanc, et naturellement si doux, qu'on peut le prendre à la main; du moins ils étoient si peu effrayés à la vue des matelots qu'il leur étoit aisé d'en tuer un très grand nombre avec des bâtons et des pierres. (De Blainville.)



Dodo, from the picture in the British Museum.

bird 'Oiseaude dégoût' (Walck-Voegel), because they were surfeited with the flesh of it. * * * But among all the species of birds which are found on this isle of sand and on all the other islets and rocks which are in the neighbourhood of the Isle of France, modern navigators have never found anything approaching to the birds above named, and which may be referred to the number of species which may have existed, but which have been destroyed by the too great facility with which they are taken, and which are no longer found excepting upon islands or coasts entirely uninhabited. At Madagascar, where there are many species of birds unknown in these islands, none have been met with resembling the description above alluded to.' (*Observations sur la Physique pour l'an* 1778, tom. xii., p. 154. Notes.)

Mr. Duncan thus concludes his paper above alluded to: Having applied, through the medium of a friend, to C. Telfair, Esq. of Port Louis, in the Mauritius, a naturalist of great research, for any information he could furnish or procure relating to the former existence of the Dodo in that sland, I obtained only the following partly negative statement:—

'That there is a very general impression among the inhabitants that the Dodo did exist at Rodriguez, as well as in the Mauritius itself; but that the oldest inhabitants have never seen it, nor has the bird or any part of it been preserved n any museum or collection formed in those islands, although some distinguished amateurs in natural history have passed their lives on them, and formed extensive collections. And with regard to the supposed existence of the Dodo in Madagascar, although Mr. Telfair had not received, at the time of his writing to Europe, a reply to a letter on the subect which he had addressed to a gentleman resident on that island, yet he stated that he had not any great expectations from that quarter; as the Dodo was not mentioned in any of his voluminous manuscripts respecting that island, which contained the travels of persons who had traversed Madagascar in all directions, many of them having no other object in view than that of extending the bounds of natural history'

We close this part of the case with the evidence of one evidently well qualified to judge, and whose veracity there is no reason to doubt. If this evidence be, as we believe it to be, unimpeachable, it is clear not only that the Dodo existed, but that it was publicly exhibited in London. The lacunæ in the print represent the spaces occasioned by a hole burnt in the manuscript.

In Sloane MSS. (No. 1839, 5, p. 108, Brit. Mus.) is the following interesting account by L'Estrange in his observations on Sir Thomas Browne's 'Vulgar Errors.' It is worthy of note that the paragraph immediately follows one on the 'Estridge' (Ostrich).

'About 1638, as I walked London streets I *saw the* picture   of a strange fowl hong out upon a cloth   vas and myselfe with one or two more Gen. in company went in to see it. It was kept in a chamber, and was a great fowle somewhat bigger than the largest Turkey Cock and so legged and footed but stouter and thicker and of a more erect shape, coloured before like the breast of a yong Cock Fesan (pheasant), and on the back of dunn or deare coulour. The keeper called it a Dodo and in the ende of a chimney in the chamber there lay an heap of large pebble stones whereof hee gave it many in our sight, some as bigg as nutmegs, and the keeper told us shee eats them conducing to digestion and though I remember not how farre the keeper was questioned therein yet I am confident that afterwards she cast them all agayne.'*

EVIDENCE ARISING FROM REMAINS.

The only existing recent remains attributed to the Dodo are, a leg in the British Museum, and a head (a cast of which is in Brit. Mus.), and a leg in the Ashmolean Museum at Oxford, the relics most probably of Tradescant's bird. Whether the leg formerly in the museum of Pauw be that at present in the British Museum may be, perhaps, doubtful, though we think with Mr. Gray that they are probably

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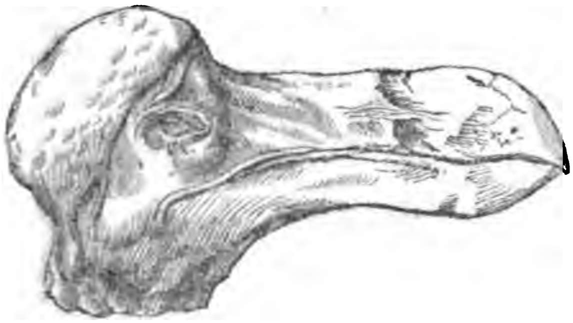
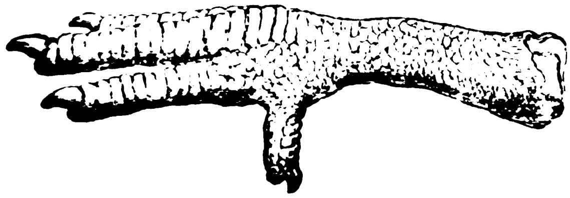
* This curious statement is extracted in the recent edition of Sir Thomas Brown's works by Wilkins; published by Pickering.

identical; but that the specimen in the British Museum did not belong to Tradescant's specimen is clear, for it existed in the collection belonging to the Royal Society when Tradescant's 'Dodar' was complete. In the 'Annales des Sciences' (tome xxi. p. 103, Sept. 1830) will be found an account of an assemblage of fossil bones, then recently discovered, under a bed of lava, in the Isle of France, and sent to the Paris Museum. They almost all belonged to a large living species of land-tortoise, called *Testudo Indica*, but amongst them were the head, sternum, and humerus of the dodo. 'M. Cuvier,' adds Mr. Lyell in his "Principles of Geology," 'showed me these valuable remains at Paris, and assured me that they left no doubt in his mind that the huge bird was one of the gallinaceous tribe'



Head of Dodo (from cast of Oxford specimen,



Foot of Dodo (specimen in the British Museum.

In a letter addressed to the Secretary of the Zoological Society, by Charles Telfair, Esq., Corr. Memb. Z. S., dated Port Louis (Mauritius), November 8, 1832, and read before a meeting of the society on the 12th March, 1833, it appeared that Mr. Telfair had recently had opportunities of making some researches about the buried bones of the Dronte or Dodo found in the Island of Rodriguez. The result of these researches he communicated, and enclosed letters addressed to him by Col. Dawkins, military secretary to the Governor of the Mauritius, and by M. Eudes, resident at Rodriguez.

Col Dawkins, it was stated, in a recent visit to Rodriguez, conversed with every person whom he met respecting the *Dodo*, and became convinced that the bird does not exist there. The general statement was that no bird is to be found there except the *Guinea-fowl* and *Parrot*. From one person, however, he learned the existence of another bird, which was called *Oiseau-bœuf*, a name derived from its voice, which resembles that of a cow. From the description given of it by his informant, Col. Dawkins at first believed that this bird was really the *Dodo;* but on obtaining a specimen of it, it proved to be a *Gannet* (apparently referable to the *Lesser Gannet* of Dr. Latham, the *Sula candida* of Brisson, and the *Pelecanus Piscator* of Linnæus). It is found only in the most secluded parts of the Island. Col. Dawkins visited the caverns in which bones have been dug up, and dug in several places, but found only small pieces of bone. A beautiful rich soil forms the ground-work of them, which is from six to eight feet deep, and contains no pebbles. No animal of any description inhabits these caves, not even bats.

M. Eudes succeeded in digging up in the large cavern various bones, including some of a large kind of bird, which no longer exists in the Island: these he forwarded to Mr. Telfair, by whom they were presented to the Zoological Society. The only part of the cavern in which they were found was at the entrance, where the darkness begins; the little attention usually paid to this part by visitors may be the reason why they have not been previously found. Those near the surface were the least injured, and they occur to the depth of three feet, but nowhere in considerable quantity; whence M. Eudes conjectured that the b[illegible] was at all times rare, or at least uncommon. A bird [illegible] large a size as that indicated by the bones had never [illegible] seen by M. Gory, who had resided forty years on the [illegible] M. Eudes added that the Dutch who first landed at R[illegible]guez left cats there to destroy the rats which a[illegible] them: these cats have since become very numerous, [illegible] prove highly destructive to poultry; and he suggested [illegible] probability that they may have destroyed the large k[illegible] bird to which the bones belonged, by devouring the [illegible] ones as soon as they were hatched,—a destruction [illegible] may have been completed long before the Island w[illegible] habited.

The bones procured by M. Eudes for Mr. Telfair w[illegible] presented by that gentleman to the Zoological Society. [illegible] the reading of the letter, &c., they were laid on the [illegible] and consisted of numerous bones of the extremities of [illegible] or more large species of *Tortoise*, several bones of [illegible] hinder extremity of a large bird, and the head of a *hu*[illegible] With reference to the metatarsal bone of the bird, [illegible] was long and strong, Dr. Grant pointed out that it [illegible]sessed articulating surfaces for four toes, three d[illegible] forwards and one backwards, as in the foot of the [illegible] preserved in the British Museum, to which it was [illegible] proportioned in its magnitude and form. (Zool. Proc. [illegible] Part 1.)

OPINIONS OF ZOOLOGISTS AND SUPPOSED PLACE IN THE ANIMAL SERIES.

Piso, in his edition of Bontius, places the Dodo imm[illegible]diately before the Cassowary; and here we may observe [illegible] the figure of Bontius does not appear to be identical [illegible] the picture which now hangs in the British Mu[illegible] Though there is a general resemblance there are pa[illegible] differences which go far to show, at all events, that the [illegible] of Bontius and that in the picture are different portraits.

Willughby's eighth chapter treats of 'The greatest [illegible] birds, of a peculiar kind by themselves, which, by reas[illegible] the bulk of their bodies, and the smallness of their w[illegible] cannot fly, but only walk. The *Ostrich* occupies th[illegible] section of this chapter, and the *Dodo* the fourth and [illegible] being immediately preceded by 'the Cassowary or E[illegible] Ray's section 'Aves rostris rectioribus minusque h[illegible] maximæ, singulares et sui generis, ob corporum m[illegible] alarum brevitatem volandi impotes' contains the same [illegible] as Willughby's eighth chapter, viz.: the *Ostrich*, the *Am*[illegible]*can Ostrich*, the *Emeu, Eme* or *Cassowary*, and, lastly, [illegible] *Dodo*.

Moehring, and after him, Brisson, gives the bird, u[illegible] the name of *Raphus*, a position next to the *Ostrich*[illegible]

Buffon places it independently.

Linnæus, in his last edition of the 'Systema Naturæ' [illegible] 12th, 1766), places the bird at the head of his '*G*[illegible] the order immediately succeeding the '*Grallæ*,' under [illegible] name of *Didus ineptus*, and immediately before the g[illegible] *Pavo* (Peacocks). The genus *Struthio* is the last [illegible] *Grallæ*, and *Rhea* (American Ostrich) the last spe[illegible] *Struthio*, so that *Didus ineptus* stands between *S*[illegible] *Rhea*, Linn., and *Pavo cristatus* (the Peacock). I[illegible] former edition Linnæus had noticed the bird under [illegible] name *Struthio cucullatus*.

Latham in his synopsis (1782) followed Linnæus, [illegible] gave three species, viz., the *Hooded Dodo*, the *S*[illegible] *Dodo*, and the *Nazarene Dodo*.

Gmelin, in his edition of the 'Systema Naturæ' [illegible] makes *Psophia* (Trumpeter) the last genus of the L[illegible] *Grallæ*, and *Otis* (Bustard) the first genus of the L[illegible] *Gallinæ*, under which last-mentioned order he a[illegible] the genus *Didus*, placing it between the genera *S*[illegible] and *Pavo*, which are both included by Gmelin in the [illegible] *Gallinæ*. He also gives three species:—1st. *Didus* [illegible] which he describes as 'black, clouded with white, [illegible] tetradactyle feet.' The following are his synonyms [illegible] *Didus*, Syst. Nat. xii. 1, p. 267, n. 1; *Struthio cu*[illegible] Syst. Nat. x. p. 155; *Raphus*, Briss. Av. 5, p. [illegible] *Cygnus cucullatus*, Nieremb. Nat. 231; *Gallus g*[illegible] *peregrinus*, Clus. Exot. 99, t. 10; Olear. Mus. [illegible] 5: *Dronte*, Bont. Jav. 70, Buff. Hist. Nat. des O[illegible] 480; *Dod-aersen* or *Walgh-Vogel*, Herbert it. p. [illegible] 383; *Dodo*, Raj. Av. p. 37, n. 8; Will. Orn. p. 15[illegible] Edw. Glean. t. 294; *Hooded Dodo*, Lath. Syn. [illegible] t. 70. 2nd. *Didus solitarius; Solitaire*, Buff. H[illegible] des Ois. i. p. 485; Leguat it. i. p. 98; *Solitary Dodo*, Lath. Syn. iii. 1, p. 3, n. 2. This species is described by Gmelin as 'varied with grey and brown, with tetradactyle feet.' 3rd. *Didus Nazurenus; Oiseau de Nazareth, et Oiseau de Nausée*, Buff. Hist. Nat. des Ois. i. p. 485; Cauche, Madag. p. 130; *Nazarene Dodo*, Lath. Syn. iii. 1, p. 4, n. 3. Gmelin describes this species as 'black, with tetradactyle feet.'

Blumenbach followed Linnæus; and Duméril and Vieillot followed Latham.

Temminck instituted in his 'Analyse du Système Général d'Ornithologie,' the order *Inertes*, for the *Dodo* and the *Apteryx*; two birds, as Mr. Yarrell in his paper on the *Apteryx* (*Trans. Zool. Soc.*, vol. i., p. 71) observes, differing decidedly from each other in their beaks; but in reference to their imperfect wings, as also in the nature of their external covering, having obvious relation to the species included in his order *Cursores*. 'But,' adds Mr. Yarrell, 'the situation chosen for this order *Inertes*, at the extreme end of his systematic arrangement, leads me to infer that M. Temminck considered as imaginary the subjects for which it was formed.'

Illiger, in his *Prodromus* (1811), instituted the order Inepti for the reception of the *Dodo* alone, *Apteryx* not being then known, and he placed it immediately preceding his *Cursores*, containing the *Struthious Birds*.

Cuvier, in the first edition of his *Règne Animal* at the end of his notice on his family *Brevipennes* (*Les Autruches, Struthio*, Linn.), has the following note appended to his description of the last species, *Rhea*. 'I cannot place in this table species but badly known, or, more, so little authentic as those which compose the genus *Didus*. The first or the *Dronte* (*Didus ineptus*) is only known from a description given by the first Dutch navigators, and preserved by Clusius, *Exot.* p. 99, and by an oil-painting of the same epoch copied by Edwards, pl. 294; for the description of Herbert is puerile, and all the others are copied from Clusius and Edwards. It would seem that the species has entirely disappeared, and we now possess no more of it at the present day than a foot preserved in the British Museum (Shaw, *Nat. Miscell.* pl. 143), and a head in bad condition in the Ashmolean Museum at Oxford. The bill does not seem to be without some relation to that of the *Auks* (*Pingouins*), and the foot would bear considerable resemblance to that of the *Penguins* (*Manchots*), if it were palmated. The second species, or the *Solitaire* (*Didus Solitarius*), rests only on the testimony of Leguat, *Voy.* i. p. 98, a man who has disfigured the best known animals, such as the *Hippopotamus* and *Lamantin*. Finally, the third species, or *L'Oiseau de Nazare* (*Didus Nazarenus*), is only known through François Cauche, who regards it as the same as the *Dronte*, and yet only gives it three toes, while all other authors give four to the Dronte. No one has been able to see any of these birds since these voyagers.' In the second edition (1829), the note is repeated with the addition of a notice of Apteryx. With every reverence for the great zoologist who wrote it, it is impossible to avoid observing the haste and incorrectness which mark it. His opinions certainly underwent considerable modification. When he was in this country at the period of the last French revolution, he had an opportunity of seeing the head preserved in the Ashmolean Museum, and the foot in the British Museum, and he doubted the identity of this species with that of which the painting is preserved in the National collection. Lyell mentions these doubts, and we must here recall to the reader the geologist's statement above alluded to, that Cuvier showed him the valuable remains in Paris, and that he assured him that they left no doubt on his mind that the huge bird was one of the Gallinaceous tribe. (*Sur Quelques Ossemens, &c., Ann. des Sci.*, tome xxi., p. 103, Sept., 1830.)

Shaw, as appears indeed from Cuvier's note, made mention of the Dodo in his Naturalist's Miscellany (plates 142 and 143), giving a figure of the head preserved in the Ashmolean Museum, and in his Zoological Lectures. The continuer of his 'Zoology' has the following sweeping notice of the bird:—'The Dodo of Edwards appears to have existed only in the imagination of that artist, or the species has been utterly extirpated since his time, which is scarcely probable. Its beak is said to be deposited in the Ashmolean Museum at Oxford, and a foot in the collection in the British Museum. The former appears rather to belong to some unknown species of albatross than to a bird of this order, and the latter to another unknown bird; but upon what authority it has been stated to belong to the Dodo, I am at a loss to determine. A painting by Edwards still exists in the British Museum.'

'This hasty judgment,' says Mr. Duncan in his paper in the Zoological Journal, 'is fully refuted, especially by the existing head, and the exact resemblance of the leg at Oxford to that in London.'

Mr. Vigors, in his paper 'On the Natural Affinities that connect the Orders and Families of Birds' (*Linn. Trans.*, vol. xiv., p. 395, read December 3, 1823), thus writes on the subject of the *Dodo*:—'Considerable doubts have arisen as to the present existence of the Linnæan *Didus*; and they have been increased by the consideration of the numberless opportunities that have latterly occurred of ascertaining the existence of these birds in those situations, the isles of Mauritius and Bourbon, where they were originally alleged to have been found. That they once existed I believe cannot be questioned. Besides the descriptions given by voyagers of undoubted authority, the relics of a specimen preserved in the public repository of this country, bear decisive record of the fact. The most probable supposition that we can form on the subject is, that the race has become extinct in the before-mentioned islands, in consequence of the value of the bird as an article of food to the earlier settlers, and its incapability of escaping from pursuit. This conjecture is strengthened by the consideration of the gradual decrease of a nearly conterminous group, the *Otis tarda* of our British ornithology, which, from similar causes, we have every reason to suspect will shortly be lost to this country. We may, however, still entertain some hopes that the *Didus* may be recovered in the south-eastern part of that vast continent, hitherto so little explored, which adjoins those islands, and whence, indeed, it seems to have been originally imported into them. I dwell upon these circumstances with more particularity, as the disappearance of this group gives us some grounds for asserting, that many chasms which occur in the chain of affinities throughout nature may be accounted for on the supposition of a similar extinction of a connecting species. Here we have an instance of the former existence of a species that, as far as we can now conclude, is no longer to be found; while the link which it supplied in nature was of considerable importance. The bird in question, from every account which we have of its economy, and from the appearance of its head and foot, is decidedly Gallinaceous; and, from the insufficiency of its wings for the purposes of flight, it may with equal certainty be pronounced to be of the *Struthious* structure, and referable to the present family. But the foot has a strong hind toe, and, with the exception of its being more robust,—in which character it still adheres to the *Struthionidæ*,—it corresponds exactly with the foot of the Linnæan genus *Crax*, that commences the succeeding family. The bird thus becomes osculant, and forms a strong point of junction between these two conterminous groups; which, though evidently approaching each other in general points of similitude, would not exhibit that intimate bond of connexion which we have seen to prevail almost uniformly throughout the neighbouring subdivisions of nature, were it not for the intervention of this important genus.'

M. Lesson, in his Manual (1828), after giving a description of the Dodo (genus *Dronte, Didus*, Linn., *Raphus*, Moehring, Brisson), says that the genus includes but one species which may be considered as at all authenticated, and which exists no longer; this is the *Dronte, Didus ineptus*, described by Clusius, ex. p. 99, figured by Edwards, pl. 294. 'They possess,' he adds, 'a foot and head of it at London, figured in Shaw's Miscell., pl. 143 and 166.' Then comes the following statement:—'M. Temminck has adopted, after Shaw, the genus *Apteryx*, which he thus describes.' M. Lesson, after giving the description and noticing the only known species, *Apteryx Australis*, proceeds to make the following queries: 'May not the *Dronte* be the *Cassowary* of the East Indies, to which has been added the bill of an Albatross? It is said that it was once very common in the Islands of France and of Bourbon, and that the former received the name of the Isle of Cerne from these birds. May not the *Apteryx* of M. Temminck be founded on the fragments of the *Dronte* preserved in the Museum of London?' To make the confusion complete, M. Lesson places immediately before the genus Dronte the *Emou Kivikivi, Dromiceius Novæ Zelandiæ*, Less., which is no other than the *Apteryx Australis* of Shaw, and which has been so well described and figured by Mr.

Yarrell in the first volume of the Transactions of the Zoological Society of London.

M. de Blainville, in a memoir on the *Didus ineptus*, read before the Academy of Sciences, on the 30th of August, 1834, and published in the 'Nouvelles Annales du Muséum d'Histoire Naturelle' (tome iv., p. 1, 4to., Paris, 1835), enters at large into the history of the bird, and terminates his list of authors thus: 'Finally, not long ago (assez dernièrement) in England, an anonymous author, whom I believe to be Mr. Mac Leay, has returned to the idea that this genus ought to be placed among the Gallinaceous birds. Nevertheless, although he pronounces that the *Dronte* is decidedly a bird of this family, he adds, that it may, with the same certainty, be referred to the *Struthionidæ*, on account of the smallness of its wings; but, adds he, as the foot is provided with a hallux (pouce), it departs (s'eloigne) from this family to approach the genus *Crax*, *qui dont la* [illegible], according to him. Thus it is one of those genera which he names osculant, forming the passage from one group to another.' Who this anonymous author may be we do not presume to guess, but we have the best authority for asserting that Mr. W. S. Mac Leay is not the person. From the context, we think it probable that Mr. [illegible] opinions above given are alluded to, *Crax* being a [illegible] the [illegible].

M. de Blainville, after giving the different points on which the claim of the Dodo to be considered a gallinaceous bird rests, and the reasons for and against it, thus proceeds:—'Among the orders of birds which include the largest species, there only remain the birds of prey with which the Dodo can be compared, and it seems to us that it is to them that the bird bears the greatest resemblance.' In proof of this it is necessary to attend to the following observations:—

1. The eyes are situated in the same part of the bill as in *Cathartes*.

2. The nostrils are oval, situated very forward, and without a superior scale, as in those birds.

3. The form of the skull, its great width in the interorbitary space, and its flatness at the sinciput, are also nearly the same as in these vultures.

4. Even the contour of the bill, and the two caruncular folds of the origin of the curved part, are nearly the same as in those birds.

5. The species of band which the skin forms at the root of the bill, and which have earned for the *Dodo* the name of *Cygnus cucullatus*, has a very similar disposition in *Cathartes*.

6. The almost entire nudity of the neck, as well as its general colour seen through the few downy feathers which cover it, are also characteristic of the vulture.

7. The form, the number, and the disposition of the toes, as well as the form and curvature of the claws, indicate a bird of that family at least as much as a gallinaceous bird.

8. The scaly system of the tarsi and of the toes more resembles that which is found in *Cathartes* than what is observed in the Gallinaceous birds.

9. The size of [illegible] at the root of the neck, and even the muscular stomach, are found in one order as well as in the other.

10. Lastly, M. de Blainville notices the absence of the [illegible], which he regards as a nearly characteristic of the [illegible] birds.

M. de Blainville, after expressing a hope that both the [illegible] which has not been seen a second time since the time of [illegible], and the Dodo may be yet recovered in the interior of Madagascar, thus concludes his memoir:—

'1. There exist in the [illegible] traces of at least the existence of a new species of walking bird [illegible], to which has been given the name of [illegible].

'2. Some traces exist in Europe since the epoch when the Dutch began to take part in the discovery of the [illegible] by the Cape of Good Hope, that [illegible].

'3. The name of Dodo is employed for the first time by [illegible] [illegible] [illegible] of [illegible] the origin and etymology of these denominations.

'4. The [illegible] of this bird is the Isle of France; there [illegible] that it has been found either at Rodriguez or at Fernandez, as has been thought, owing to the confusion, no doubt, between the *Dodo* and *Solitaire* of Leguat.

'5. The *Dronte* should be approximated to or even placed in the order of rapacious birds, near the vultures, rather than in that of the Gallinaceous birds, and, for stronger reasons, rather than among the *Grallatores* (*Echassiers*), or near the *Penguins* (*Manchots*).

'6. It is by no means certain that this bird has disappeared from the number of living animals. If this is possible in the case of the Isle of France, it is not probable in the case of Madagascar, the productions of which are so little known, and which belongs, up to a certain point, to the same archipelago.

'There remains another question to discuss, namely, whether the incrusted bones which have been lately sent to M. Cuvier from the Isle of France really belonged to the Dodo, as M. Cuvier was led to believe. It is a question which would be most easily solved by the immediate comparison of these bones with the pieces preserved in England. If this was so, which the difference of height in the tarsal bone does not permit us to believe, it would be at the same time proved that the Dodo existed also at Rodriguez, for these bones have been found in this isle in a cave (grotte), as M. Quoy, who saw them on his passage to the Isle of France, has assured me, and not at the Isle of France, under beds of lava, as M. Cuvier has stated from erroneous information, in his note read lately to the academy. Then there would be nearly a certainty that the Dodo was a Gallinaceous bird; but in making the observation that these bones come from the Isle of Fernandez, and that the description of the Solitaire of Leguat accords sufficiently well with a bird of this order, or at least with a Gallinogralle, it might be that the bones actually in the hands of M. Cuvier were no other than those of the Solitary Bird properly so called, and not those of the true Dronte.'

The memoir is illustrated with four plates: the first is a coloured copy of the head of the Dodo from the Museum portrait, of the size of the original. In the painting the author observes the head is at least a foot long from the occiput to the extremity of the bill; but the head at Oxford is only eight inches and a half, or about two-thirds. The bill, he adds, makes out nearly three-fourths of the whole length. The second plate gives a profile of the Oxford head from a sketch taken from the original, and a view of the same seen from above, and skulls of the *Urubu* and *Vultur Papa*. Plate 3 gives two views of the foot preserved in the British Museum, and the remains of the foot at Oxford; a foot of the *Heath-cock* (*Coq de Bruyère*), a foot of a *Penguin*, and a foot of *Vultur Papa*. Plate 4 gives a profile of the cast of the head at Oxford, and a view of the same seen from below.

In the British Museum (1837) in cases 65—68 (Room XIII.) are the *Ostrich*; *Bustards* 'which in many respects are allied to the *Gallinaceous Birds*;' the foot and cast of the head of the *Dodo* above alluded to: the *Courser* and *Pratincole*; and at p. 99 of the Synopsis (1832) we have the following observations: 'Over the door adjoining the twelfth room is an original painting of the Dodo, presented to the Museum by George Edwards, Esq., the celebrated ornithological artist, and copied in his works, plate No. 294, who says it was 'drawn in Holland, from a living bird brought from St. Maurice's Island in the East Indies.' The only remains of this bird at present known are a foot (case 65) in this collection (presented by the Royal Society) and a head and foot, said to have belonged to a specimen which was formerly in Tradescant's Museum, but is now in the Ashmolean Museum at Oxford. The cast of the head above mentioned (in the same case) was presented by P. Duncan, Esq. The bird in the shortness of the wings resembles the ostrich, but its foot, in general, rather resembles that of the common fowl, and the beak, from the position of its nostrils, is most nearly allied to the Vultures; so that its true place in the series of birds, if indeed such a bird ever really existed, is not, as yet, satisfactorily determined.'

Mr. Swainson (*Natural History and Classification of Birds*, 1836), speaking of the birds of prey, says (p. 285), 'The third and last type of this family appears to us to be the *Secretary Vulture* of Africa, forming the genus *Gypogeranus*. At least we cannot assign it to any other known division of the *Raptores*, without separating it much more widely from its congeners than our present state of knowledge will sanction. It has been thought, indeed, that this remarkable bird represented one of the primary divisions of the whole order; in which case it would stand between the owls and the *Dodo*: but its similarity to the vultures and the falcons, in our opinion, is too great to favour this supposition; while, on the other hand, it will subsequently appear that the circle of the *Falconidæ* is sufficiently complete to show that it does not enter into that family.' After some other observations, Mr. Swainson concludes his observations on the *Secretary* thus: 'It must be remembered, also, that the very same objections occur against placing this bird (the *Secretary*) between the *Strigidæ* (owls) and the *Didinæ* (Dodos), as those we have intimated against considering it as the grallatorial type of the *Vulturidæ*.'

That a bird or birds called by the name of *Dodo* and the other appellations which we need not here repeat once existed, we think the evidence above given sufficiently proves. We have, indeed, heard doubts expressed whether the Museum portrait was taken 'from a living bird,' and have also heard it suggested that the picture may represent a specimen made up of the body of an ostrich to which the bill and legs of other birds have been attached. And here it is that the destruction of Tradescant's specimen becomes a source of the greatest regret. Whatever was the condition of that specimen, as long as the skin was preserved there existed the means of ascertaining whether it was real or a made-up monster; and when the Vice-Chancellor and the other curators in making their lustration gave the fatal nod of approbation they destroyed that evidence. With regard to the picture we have endeavoured to place it before the reader as well as our limited means will permit, in order that he may have an opportunity of judging from the internal evidence as to the probability of the portrait being taken from a living bird, and with this view we have given the accessories as they appear in the painting as well as the principal figure.

Mr. Gray, among others, still inclines, we believe, to the opinion that the bird represented was made up by joining the head of a bird of prey approaching the Vultures, if not belonging to that family,[*] to the legs of a Gallinaceous bird, and his opinion, from his attainments and experience, is worthy of all respect. But, if this be granted, see what we have to deal with. We have then two species, which are either extinct or have escaped the researches of all zoologists to account for; one, a bird of prey, to judge from its bill, larger than the Condor; the other a Gallinaceous bird, whose pillar-like legs must have supported an enormous body. As to the stories of the disgusting quality of the flesh of the bird found and eaten by the Dutch, that will weigh but little in the scale when we take the expression to be, what it really was, indicative of a comparative preference for the turtle-doves there found, after feeding on *Dodos usque ad nauseam.* 'Always Partridges' has become almost proverbial, and we find from Lawson how a repetition of the most delicious food palls. 'We cooked our supper,' says that traveller, 'but having neither bread nor salt, our fat turkeys began to be loathsome to us, although we were never wanting of a good appetite, yet a continuance of one diet made us weary;' and again, 'By the way our guide killed more turkeys, and two polecats, which he eat, esteeming them before fat turkeys.'

With regard to the form of the bill, we must be careful how we lay too much stress on that. Who would have expected to find a bill 'long, slender, smooth, and polished, in form resembling that of an *Ibis*, but rather more straight and depressed at the base[*], on an Emeu-like body with muscular legs and feet?' Yet such is the form of *Apteryx*. As to the argument arising from the absence of the spur it is worth but little at best; and it may be said in favour of those who would place the Dodo between the Struthious and Gallinaceous birds, that its absence in such an essentially cursorial bird would be expected.

If the picture in the British Museum, and the cut in Bontius be faithful representations of a creature then living, to make such a bird a bird of prey—a Vulture, in the ordinary acceptation of the term—would be to set all the usual laws of adaptation at defiance. A Vulture without wings! How was it to be fed? And not only without wings, but necessarily slow and heavy in progression on its clumsy feet. The *Vulturidæ* are, as we know, among the most active agents for removing the rapidly decomposing animal remains in tropical and intertropical climates, and they are provided with a prodigal development of wing to waft them speedily to the spot tainted by the corrupt incumbrance. But no such powers of wing would be required by a bird appointed to clear away the decaying and decomposing masses of a luxuriant tropical vegetation,—a kind of Vulture for vegetable impurities, so to speak,—and such an office would not be by any means inconsistent with comparative slowness of pedestrian motion.

DODO'NA, the most antient oracle of Greece, was probably situated in the valley of Joannina in Epirus, but its exact position has never been ascertained. Dionysius of Halicarnassus places it four days' journey from Buthrotum, and two from Ambracia. (*Antiqu. Rom.* i. 5.) Colonel Leake places it at the south-east extremity of the lake of Joannina, near Kastritza (*Travels in Northern Greece*, vol. iv., p. 168, and following), and there are many reasons for believing that the Dodonæan territory corresponded to the valley at the south of that sheet of water. It is true that there is no mention of a lake in the neighbourhood of the antient Dodona; but it is described as surrounded by marshes, and it is not unlikely that the lake of Joannina may have been increased in later times from the catavothra in the country. (Leake, iv. p. 197.) The temple at Dodona was dedicated to Jupiter, and was of Pelasgian origin. (Hom. *Iliad*, xvi. 233; Herod. ii. 52.) Strabo is of opinion (vii. p. 329), that the priests at this temple were originally men, but that the duties of the office were afterwards performed by three old women. The people who had the management of the temple are called Selli or Helli. (Creuzer, *Symbol.* i., p. 193, note 359.) The oracles were delivered from an oak (Sophocles, *Trachin.* 1171) or beech (Hesiod. ap. *Strabon.*, p. 227; Sophocl. *Trach.* 173). The temple at Dodona was entirely destroyed by Dorimachus, the Ætolian prætor, B.C. 219 (Polyb. iv. 67), and probably was never restored, for it did not exist in the time of Strabo (p. 327); but there was a town of the name in the seventh century A.D., and a bishop of Dodona is mentioned in the council of Ephesus. (Wesseling on Hierocles' *Synecdoche*, p. 651.)

There is a long article on Dodona in the Fragment of Stephanus Byzantinus, which is printed at the end of his work.

DODSLEY, ROBERT, was born in 1703, at Mansfield, in Nottinghamshire, where his father is said to have kept the free school. Robert and several brothers, however, appear to have all commenced life as working artisans, or servants. Robert is said to have been put apprentice to a stocking-weaver, from whom, finding himself in danger of being starved, he ran away, and took the place of a footman. After living in that capacity with one or two persons, he entered the service of the Honourable Mrs. Lowther, and while with that lady he published by subscription in 1732 an octavo volume of poetical pieces, under the title of 'The Muse in Livery, or the Footman's Miscellany.' The situation of the author naturally drew considerable attention to this work at the moment of its appearance; but the poetry was of no remarkable merit. His next production was a dramatic piece, called 'The Toyshop;' he sent it in manuscript to Pope, by whom it was much relished, and who recommended it to Rich, the manager of Covent Garden theatre, where it was acted in 1735 with great success. With the profits of his play Dodsley the same year set up as a bookseller; and, under the patronage which Pope's friendship and his own reputation and talents procured him, his shop in Pall Mall soon became a distinguished resort of the literary loungers about town. His business, which he conducted with great spirit and ability, prospered accordingly; and in his latter days he might be considered as standing at the head of the bookselling trade. He continued also throughout his life to keep himself before the public in his first profession of an author, and produced a considerable number of works of varying degrees of merit, both in prose and verse. In 1737 his farce of 'The King and the Miller of Mansfield' was acted at Drury Lane with great applause. It was followed the same year by a sequel, under the title of 'Sir John Cockle at Court,' which however was not so successful. Nor was he more fortunate with his ballad farce of 'The Blind Beggar of Bethnall Green,' which was brought out at Drury Lane in 1741. This year also he set up a weekly magazine, under the title of 'The Public Register,' to which he was himself a principal contributor; but it was discontinued after the publication of the twenty-fourth number. It is curious to note that, in his farewell address to his readers, he complains that certain rival magazine publishers (understood to mean the proprietors of the Gentleman's Magazine) had exerted their influence with success to prevent the newspapers from advertising his work. In 1745 he published another short dramatic piece, entitled 'Rex et Pontifex, being an attempt to introduce upon the stage a new species of pantomime;' but this never was acted. A collected edition of all these dramas was published in 1748, in a volume, to which he gave the title of 'Trifles.'

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[*] Mr. *Gray's* reasons for considering the Dodo as belonging to the *Raptores* chiefly rest on the following facts, premising, as he does, that it is to be borne in mind that in the Raptorial birds the form of the bill is their *chief* critical character, which is not the case with the Gallinaceæ or the *Natatores*, where the form of the feet and legs are the *chief* character of the order.

'1. The base of the bill is surrounded by a *Cere*, as may be seen in the cast where the limits of the *Cere* are distinctly exhibited, especially over the back of the nostrils. The *Cere* is only found in the Raptorial birds.

'2. The nostrils are placed exactly in front of the *Cere*, as they are in the other *Raptores*: they are oval, and nearly erect, as they are in the *true Falcons*, and in that genus alone, and not longitudinal as they are in the *Columbæ*, all the *Gallinaceous birds*, *Grallatores* and *Natatores*, and they are arched and covered with an arched scale, as is the case in all the *Gallinaceæ*.

'3. In Edwards's picture the bill is represented as much hooked (like the *Raptores*) at the tip, a character which unfortunately cannot be verified on the Oxford head, as that specimen is destitute of the horny sheath of the bill, and only shows the form of the bony core.

'With regard to the size of the bill, it is to be observed, that this part varies greatly in the different species of vultures, indeed so much so, that there is no reason to believe that the bird of the Oxford head was much larger than some of the known vultures.

'With regard to the *feet*,' adds Mr. *Gray*, 'it has all the characters of that of the *Gallinaceous birds*, and differs from all the vultures in the shortness of the middle toe, the form of the scales on the leg, and the bluntness of the claws.'

[*] Yarrell's 'Description of Apteryx Australis,' *Trans. Zool. Soc.*, vol. i.

The following year he produced a masque on the subject of the peace of Aix-la-Chapelle, under the title of 'The Triumphs of Peace,' which was set to music by Dr. Arne, and performed at Drury Lane. In 1750 appeared anonymously his ingenious and well known little work, 'The Economy of Human Life,' which was long attributed to Lord Chesterfield, and was from the first extremely popular. The first part, entitled 'Agriculture,' of a poem in blank verse, on the subject of public virtue, which he published in 1754, was so coldly received that the second and third parts which he originally contemplated were never produced. In 1758 he closed his career of dramatic authorship with a tragedy entitled 'Cleone,' which was acted at Covent Garden with extraordinary applause, and drew crowded audiences during a long run. When it was published, 2000 copies were sold the first day, and it reached a fourth edition within the year. 'Cleone,' however, is now nearly forgotten; although Dr. Johnson declared that if Otway had written it he would have been remembered for nothing else,—a compliment which the modest author, when it was reported to him, observed with some displeasure was 'too much.' Dodsley died at Durham, while on a visit to a friend, on the 25th of September, 1764. He had retired from business some years before, having made a good fortune. Dodsley's name is associated with several works of which he was only the projector and the publisher, but from his connexion with which he is now more generally remembered than for his own productions. Among them may be mentioned the two periodical works, 'The Museum,' begun in 1746 and extended to three volumes, in which there are many able essays by Horace Walpole, the two Wartons, Akenside, &c. (of this Dodsley was only one of the shareholders), and 'The World,' 1754-57, conducted by Edward Moore, and contributed to by Lords Lyttelton, Chesterfield, Bath, and Cork, Horace Walpole, Soame Jenyns, &c.; 'The Preceptor,' 2 vols., 1748, to which Johnson wrote a preface; and especially the 'Annual Register,' begun in 1758, and still carried on and known by his name. [ANNUAL REGISTER.] These and the other works in which he was engaged brought him into intimate connexion with most of the eminent men belonging to the world of letters during the period of his able and honourable career. He has also the credit of having first encouraged the talents of Dr. Johnson, by purchasing his poem of London in 1738, for the sum of ten guineas, and of having many years afterwards been the projector of the English Dictionary. A second volume of Dodsley's collected works, forming a continuation of the 'Trifles,' was published under the title of 'Miscellanies,' in 1772. (Besides the articles in the second edition of the 'Biographia Britannica,' in Chalmers, and in the 'Biographia Dramatica,' there are many notices respecting Dodsley in Nichols's 'Literary Anecdotes of the Eighteenth Century.')

DODSWORTH, ROGER, an eminent antiquary, was the son of Matthew Dodsworth, registrar of York Cathedr and chancellor to Archbishop Matthews. He was b July 24, 1585, at Newton Grange in the parish of St. Oswald, in Rydale, Yorkshire. He died in the month August, 1654, and was buried at Rufford in Lancash His manuscript collections, partly relating to Yorkshire, a hundred and sixty-two volumes folio and quarto, a hund and twenty-two of them in his own hand-writing, w bequeathed to the Bodleian Library at Oxford, in 1671. General Fairfax, who had been Dodsworth's patron. C mers says that Fairfax allowed Dodsworth a yearly sal to preserve the inscriptions in churches.

Dodsworth was the projector, and collected many of th materials for the early part of the work now known as 'Du dale's Monasticon,' in the title page of the first volu which his name appears as one of the compilers.

There is a detailed catalogue of the contents of D worth's collections, now in the Bodleian, in the g catalogue of the Manuscripts of England and Ireland. Oxon. 1697. (Gough's *Brit. Top.* vol. i. pp. 123-4; Chalmers's *Biogr. Dict.* vol. xii., p. 180; and the pref. to t last edition of the *Monasticon.*)

DODWELL, HENRY, was born in Dublin in 164 His father, who had been in the army, possessed some property in Ireland, but having lost it in the rebellion, h brought over his family to England, and settled at York 1648. Young Dodwell was here sent to the free sch where he remained for five years. In the meantime b his father and mother had died, and he was reduced f season to great difficulties and distress from the want of pecuniary means, till, in 1654, he was taken under the p tection of a brother of his mother's, at whose expense h was sent, in 1656, to Trinity College, Dublin. Here h eventually obtained a fellowship, which however he rel quished in 1666, owing to certain conscientious scrup against taking holy orders. In 1672, on his return to I land, after having resided some years at Oxford, he made h first appearance as an author by a learned preface, w which he introduced to the public a theological tract of late Dr. Stearn, who had been his college tutor: it w entitled 'De Obstinatione,' and published at Dublin. D well's next publication was a volume entitled 'Two Letter Advice: 1. For the Susception of Holy Orders: 2. F Studies Theological, especially such as are rational.' It peared in a second edition in 1681, accompanied with 'Discourse on the Phœnician History of Sanchoniat the fragments of which, found in Porphyry and Eu he contends to be spurious. Meanwhile, in 1674, Dod had settled in London, and from this time to his death led a life of busy authorship. Many of his publications w on the popish and nonconformist controversies; they h the reputation of showing, like everything else he w extensive and minute learning, and great skill in the ap cation of his scholarship, but little judgment of a larger k Few, if any, of the champions of the church of En have strained the pretensions of that establishment so f Dodwell seems to have done; but his whole life attested perfect conscientiousness and disregard of personal con quences under which he wrote and acted. In 1688 he w elected Camden Professor of History by the Universi Oxford, but was deprived of his office, after he had h about three years, for refusing to take the oath of alleg to William and Mary. He now retired to the villa Cookham in Berkshire, and soon after to Shottesbrooke the same neighbourhood, where he spent the rest of his d He possessed, it appears, an estate in Ireland, but allowed a relation to enjoy the principal part of the re only reserving such a moderate maintenance for hims sufficed for his simple and unexpensive habits of life. I said however that his relation at length began to grum the subtraction even of this pittance; and on that Dod resumed his property, and married. He took this s 1694, in his 53rd year, and he lived to see himself the ther of ten children. The works for which he is now c remembered were also all produced in the latter part life. Among these are his Dissertations and Annotation the Greek Geographers, published in Hudson's 'Geo phiæ Veteris Scriptores Græci Minores,' Oxon. 1698, 1 and 1712; his 'Annales Thucydidei et Xenophontei,' 1 his 'Chronologia Græco-Romana pro Hypothesibus D Halicarnassei,' 1692; and his 'Annales Velleiani, Qu tiliani, Statiani,' 1698. These several chronological t which are drawn up with great ability, have all b repeatedly reprinted. Dodwell's principal work is considered to be his 'De Veteribus Græcorum Romanorumque Cyclis, Obiterque de Cyclo Judæorum ac Ætate Christi, Dissertationes,' 4to., Oxon., 1701. He also published in 8vo., in 1706, 'An Epistolary Discourse, proving from the Scriptures and the first Fathers, that the Soul is a principle naturally mortal, but immortalized actually by the pleasure of God, to punishment or to reward, by its union with the divine baptismal spirit; wherein it is proved that none have the power of giving this divine immortalizing spirit since the Apostles, but only the Bishops.' This attempt to make out for the bishops the new power of conferring immortality raised no small outcry against the writer, and staggered many even of those who had not seen any extravagance in his former polemical lucubrations. Of course it gave great offence to the Dissenters, all of whose souls it unceremoniously shut out from a future existence on any terms. Dodwell died at Shottesbrooke on the 7th of June, 1711. Of his sons, the eldest, Henry, who was a barrister, published anonymously in 1742, a tract, which has been generally, but perhaps erroneously, looked upon as a covert attack upon revealed religion, under the title of 'Christianity not founded on Argument;' and another, William, who was in the church, distinguished himself by some pamphlets in the controversy with Dr. Conyers Middleton about miracles; and also wrote an answer to his brother's anonymous tract just mentioned.

DOG, the English name for the digitigrade quadruped which is so faithfully attached to man.

Under the Linnæan genus *Canis* are to be found the dogs (*Canis familiaris*); the wolves (*Canis Lupus*); the hyænas (*Canis Hyæna*); the foxes (*Canis Vulpes*, &c.); the jackals (*Canis aureus*); the Mexican wolf (*Canis Mexicanus*), *Xoloitzcuintli* of Hernandez; and *Canis Thous* of Surinam.

Cuvier arranges under the genus *Canis* 'les Chiens,' the dogs properly so called (*Canis familiaris* and its varieties); the wolves (*Canis Lupus*, *C. Mexicanus*, *C. jubatus*); and the jackals (*Chacal* ou *Loup doré*, *Canis aureus*); and he observes, that the foxes (which Brisson and others have separated under the name of *Vulpes*) may be distinguished from the wolves and the dogs by their longer and more tufted tail; by a more pointed muzzle; by the pupils of their eyes, which by day present a kind of longitudinal slit instead of the round form; and by the superior incisors being less lobated (échancrées); and he observes on their fetid odour, their disposition to dig for themselves earths, and to prey upon the weaker animals. These he places in a subgenus, including the *Zerda* (*Megalotis* of Illiger, *Canis Megalotis* of Lalande, *Canis Zerda* of Gmelin); at least he terms the Zerdas *espèces de renards*, though he seems to consider them as a section, and notices them as the *Megalotis* of Illiger: the *Hyæna venatica* of Burchell, *Hyæna picta* of Temminck (wild dog of the Cape), terminates Cuvier's *Canidæ*, and he then passes on to the civets (*Viverra*).

M. Lesson, in his Manual, begins the second section of the Digitigrades with the genus *Canis*, and he adopts the following subdivisions:—

1st. Those genera which have the pupil of the eye round, including the dogs properly so called, the wolves, and the jackals.

2d. Those genera in which the pupil of the eye contracts vertically, the foxes and the *zerdas*.

3d. The dogs with hyæna-like feet; the hyæna-dog, *Canis pictus*, Desm., *Hyæna picta*, Temm., *Lycaon*, Brookes.

This article will be confined to a consideration of the dog, *Canis familiaris*, and its varieties: the other subfamilies will be treated of under their respective titles.

The specific description given by Linnæus of *Canis familiaris* is simply 'Canis caudâ (sinistrorsum) recurvatâ'—'dog with tail curled towards the left'—and his lengthened description, after enumerating the varieties, of which he gives eleven, though it may appear to some almost ridiculously minute and not very delicate, is eminently characteristic. Cuvier observes that the domestic dog, *Canis familiaris*, Linn., is distinguished by its recurved tail, and that it varies infinitely besides, in stature, form, colour, and the quality of the hair. It exhibits, he adds, 'the most singular, the most complete, and the most useful conquest that man has made. The whole species is become our property; each individual is entirely devoted to his master, adopts his manners, distinguishes and defends his property, and remains attached to him even unto death; and all this springs not from mere necessity, nor from constraint, but simply from *reconnaissance* and a true friendship. The swiftness, the strength, and the highly developed power of smelling of the dog, have made him a powerful ally of man against the other animals, and were perhaps necessary to the establishment of society. It is the only animal that has followed man all over the earth.'

Now comes the question—What was the parent stock of this faithful friend of man? Some zoologists are of opinion that the breed is derived from the wolf; others that it is a familiarized jackal; all agree that no trace of it is to be found in a primitive state of nature. That there were dogs, or rather animals of the canine form, in Europe long ago we have evidence from their remains, which we shall presently notice; and that there are wild dogs we know. India, for example, affords many of them, living in a state of complete independence, and without any indication of a wish to approach the dwellings of man. These dogs, though they have been accurately noticed by competent observers, do not throw much light on the question. They may have escaped from the dominion or half dominion of man, and have betaken themselves to a vagabond life. It becomes necessary however to examine into the state of these dogs, some of which are entirely wild, and keep to the mountain and forest, whilst others hang about the villages, and though without owners, give tokens of a more social disposition, and are tolerated as the scavengers of the place, which they clear of disgusting incumbrances, somewhat after the Portuguese fashion.

Col. Sykes thus describes the Dukhun (*Deccan*) dog, *Canis Dukhunensis*, Sykes, *Kolsun* of the Mahrattas. 'Red, paler underneath; tail bushy, pendulous; pupil rounded.' 'This is the *Wild Dog* of Dukhun. Its head is compressed and elongated; its nose not very sharp, the eyes are oblique; the pupils round, *irides* light brown. The expression of the countenance that of a coarse ill-natured *Persian Greyhound*, without any resemblance to the *Jackal*, the *Fox*, or the *Wolf*, and in consequence essentially distinct from the *Canis Quao*, or *Sumatrensis* of General Hardwicke. Ears long, erect, somewhat rounded at the top, without any replication of the *tragus*. Limbs remarkably large and strong in relation to the bulk of the animal; its size being intermediate between the *Wolf* and the *Jackal*. Neck long. Body elongated. Between the eyes and nose red brown; end of the tail blackish. From the tip of the nose to the insertion of the tail 33 inches in length; tail 8½ inches. Height of the shoulders, 16½ inches.' Colonel Sykes adds that none of the *domesticated dogs* of Dukhun are common to Europe. The first in strength and size is the *Brinjaree Dog*, somewhat resembling the *Persian Greyhound*, then (1831) in the possession of the Zoological Society, but much more powerful. The *Pariah Dog*, he states, is referable to M. Cuvier's second section. This is very numerous, not individual property, but breeds in the towns and villages unmolested. The Colonel remarks that the *Turnspit Dog*, long backed, with short crooked legs, is frequently found among the Pariahs. There is also a petted minute variety of the *Pariah Dog*, usually of a white colour, and with long silky hair, corresponding to a common *Lapdog* of Europe; this is taught to carry flambeaux and lanterns. The last variety noticed is the *Dog* with hair so short as to appear naked like the *Canis Ægyptius*. It is known to Europeans by the name of the *Polygar Dog*. (*Zool. Proc.*, part i., 1831.) In 1832 the skin of the *Wild Dog* of Nepâl was compared by Colonel Sykes with a specimen of the *Kolsun* of the Mahrattas above described, and he stated his impression to be that the animals are identical, differing only by the denser coat and more woolly feet of the Nepâl race, a difference readily accounted for by the greater cold of the elevated regions inhabited by it. He declined however pronouncing a decided opinion, which, he thought, could only be arrived at by more extensive comparison and a full acquaintance with the habits of the *Wild Dog* of Nepâl. (*Zool. Proc.*, part ii.) In 1833, Colonel Sykes placed on the table of the Zoological Society his specimen of the *Wild Dog* of Dukhun (*Canis Dukhunensis*, Sykes), for the purpose of comparing it with a skin of the *Wild Dog* of Nepâl, (*Canis primævus*, Hodgson), then recently presented to the Society by the last-named gentleman. He showed that the two dogs are perfectly similar in their general form, and in the form of the *cranium*; and that in his specimen, equally with that of Mr. Hodgson, the hinder tubercular tooth of the lower jaw is wanting. The only difference remarkable between the two specimens was in the quality and colour of the fur, that of the *Dukhun Dog* being paler and less dense than that of the individual from Nepâl. These differences, depending probably on climate and individual peculiarity, cannot be regarded as sufficient to indicate a distinction between the two races. Identical as they are in form and habits, Colonel Sykes considered them as belonging to one species. (*Zool. Proc.*, part i., 1833, and see a more detailed account in the 'Transactions of the Royal Asiatic Society.')

Mr. Hodgson, in a paper 'On the *Mammalia* of Nepâl, published in the 'Journal of the Asiatic Society of Calcutta,' mentions, *inter alia*, under the title of *Canis familiaris*, Linn., the *Pariah* as the only *Dog* of the lower and central regions. The *Thibetan Mastiff*, he states, is limited to Kachâr (Cachar), into which it was introduced from its native country, but in which it degenerates rapidly; there are, he observes, several varieties of it; he also notices his *Canis primævus*. (*Zool. Proc.*, part ii., 1834.)

These contributions we consider very interesting; but we must be on our guard against the begging of the question, which lurks under the specific name *primævus*, given by a gentleman to whom Indian zoology owes so much, and it is for this reason that we have laid before the reader the comparative views of Colonel Sykes, who has so widely extended our knowledge of the Oriental Fauna.

Mr. Bell in his 'History of British Quadrupeds,' approaches this difficult question more boldly than most zoologists. 'In order,' says Mr. Bell, 'to come to any rational conclusion on this head, it will be necessary to ascertain to what type the animal approaches most nearly, after having for many successive generations existed in a wild state, removed from the influence of domestication and of association with mankind. Now we find that there are several different instances of the existence of dogs in such a state of wildness as to have lost even that common character of domestication, variety of colour and marking. Of these two very remarkable ones are the Dhole of India, and the Dingo of Australia: there is besides a half-reclaimed race amongst the Indians of North America; and another, also partially tamed, in South America, which deserve attention; and it is found that these races, in different degrees, and in a greater degree as they are more wild, exhibit the lank and gaunt form, the lengthened limbs, the long and slender muzzle, and the great comparative strength which characterize the wolf; and that the tail of the Australian dog, which may be considered as the most remote from a state of domestication, assumes the slightly bushy form of that animal. We have here then a considerable approximation to a well-known wild animal of the same genus, in races which, though doubtless descended from domesticated ancestors, have gradually assumed the wild condition; and it is worthy of especial remark, that the anatomy of the wolf, and its osteology in particular, does not differ from that of the dogs in general, more than the different kinds of dogs do from each other. The cranium is absolutely similar, and so are all, or nearly all, the other essential parts; and to strengthen still further the probability of their identity, the dog and wolf will readily breed together, and their progeny is fertile. The obliquity of the position of the eyes in the wolf is one of the characters in which it differs from the dogs; and although it is very desirable not to rest too much upon the effects of habit or structure, it is not perhaps straining the point to attribute the forward direction of the eyes in the dogs to the constant habit, for many successive generations, of looking forwards to their master and obeying his voice.'

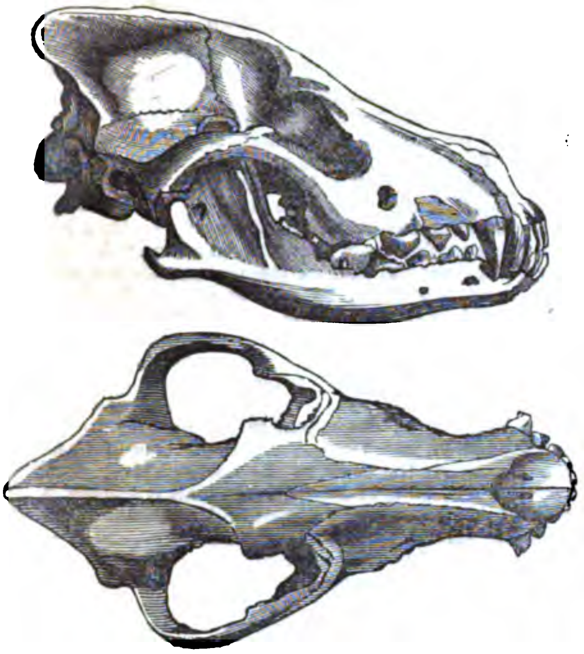
Another criterion, and a sound one, is the identity of gestation. Sixty-three days form the period during which the bitch goes with young. Precisely the same time elapses before the she-wolf gives birth to her offspring. Upon Buffon's instance of seventy-three days, or rather the possibility of such a duration in the gestation of a particular she-wolf, we do not lay much stress when opposed by such strong evidence of the usual period being sixty-three days. The young of both wolf and dog are born blind and see at the same or about the same time, viz., at the expiration of the tenth or twelfth day.

Hunter's important experiments proved without doubt that the wolf and the jackal would breed with the dog; but he had not sufficient data for coming to the conclusion that all three were identical as species. In the course of th experiments he ascertained that the jackal went fifty-n days with young, whilst the wolf went sixty-three, nor d he record that the progeny of the dog and jackal woul breed together: and he knew too well the value of t argument to be drawn from a fertile progeny not to hav dwelt upon the fact if he had proved it; not to have mentioned it, at least, if he had ever heard of it.

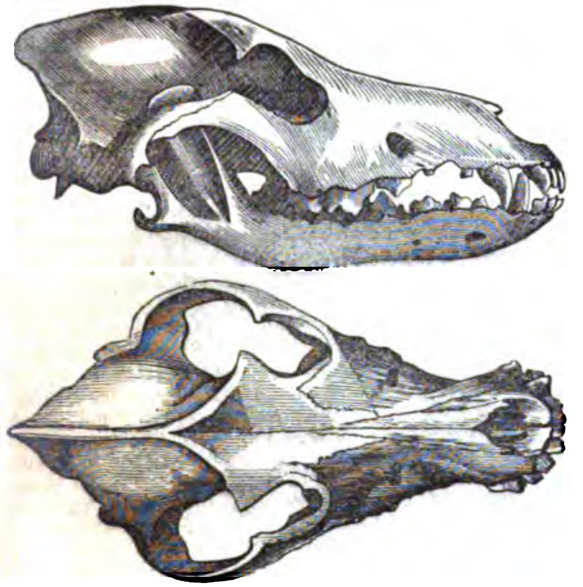
Skull of Jackal; from F. Cuvier.

Mr. Bell disposes of the objection arising from the alleged untameably savage disposition of the wolf by relating two anecdotes, one on his own authority, and the other on that of M. F. Cuvier, in proof of the susceptibility of attachment to man, and the appetite—for it is an appetite—for his caresses on the part of the wolf. The first occurred in the Gardens of the Zoological Society in the Regent's Park, London, and was exhibited in the person of a she-wolf, who came forward to be caressed, and even brought her pups to be caressed also, whenever Mr. Bell or any one whom she knew approached her den. Indeed she killed all her unfortunate young ones in succession, by rubbing them against the bars of her cage in her zeal to have them fondled by her friends. The second happened in the Ménagerie du Roi at Paris, and no faithful dog could show more affecting instances of attachment to his master or distress on account of his absence than did the male wolf which is the subject of M. F. Cuvier's touching account. 'With all these analogous properties of form and structure'—we quote Mr. Bell—'as well as of disposition, I cannot but incline at least to the opinion that the wolf is the original source from which all our domestic dogs have sprung: nor do I see in the great variety which exists in the different races sufficient ground for concluding that they may not, all of them, have descended from one common stock. The turnspit and the mastiff, the pug and the greyhound, are perhaps more unlike each other than any of the varieties of other domestic animals; but if it be true that variation depends upon habit and education, the very different employments to which dogs have in all ages been trained, and the various climates to which they have been naturalized, must not be lost sight of as collateral agents in producing these different forms. The care, too, with which dogs of particular breeds are matched with similar ones, for the purpose of keeping the progeny as pure as possible, has doubtless its effect in promoting such distinctions.' The same author thus sums up his opinion. 'Upon the whole, the argument in favour of the view which I have taken, that the wolf is probably the original of all the canine races, may be thus stated: the structure of the animal is identical, or so nearly so as to afford the strongest *à priori* evidence in its favour. The dog must have been derived from an animal susceptible of the highest degree of domestication, and capable of great affection for mankind; which has been abundantly proved of the wolf. Dogs having returned to a wild state, and continued in that condition through many generations, exhibit characters which approximate more and more to those of the wolf, in proportion as the influence of domestication ceases to act. The two animals will breed together and produce fertile young. The period of gestation is the same.

We now lay before our readers the skull of a wolf, that they may compare it with those of the different varieties of dogs.



Skull of Wolf; from F. Cuvier.

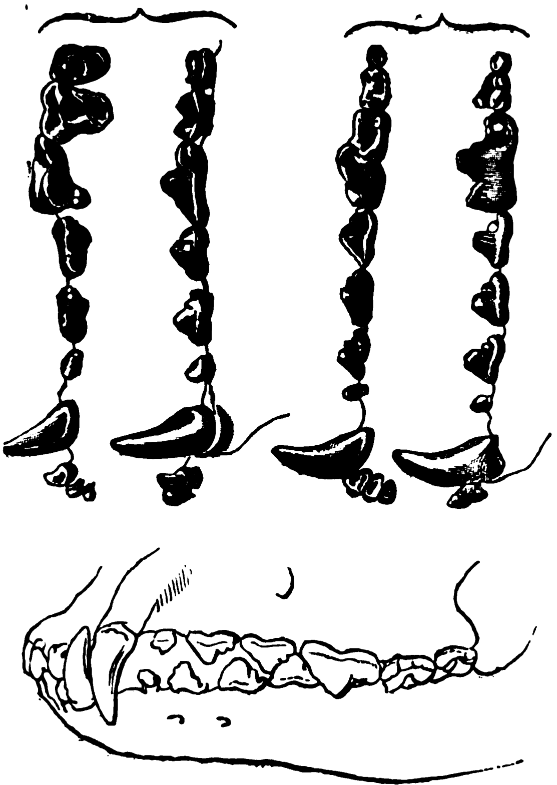


Skull of Canada Wolf; from F. Cuvier.

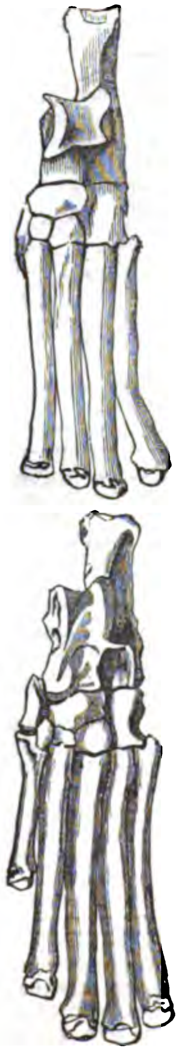
Dog.

Dental formula: incisors, $\frac{6}{6}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{6-6}{7-7}=42$. Such is M. Lesson's statement of the dentition of the great genus *Canis* of Linnæus. M. F. Cuvier says, that dogs in general have forty-nine teeth, viz. six incisors, two canines, three false molars, one carnassier, and two tubercular teeth in the upper jaw; and six incisors, two canines, three false molars, one carnassier, and two tubercular teeth in the lower jaw. Of all these teeth, he observes, none change their shape in any appreciable degree in any race whatever. Only there is sometimes found an additional false molar or tubercular tooth.*

Fore feet with five toes; hind feet with four toes; claws not retractile.



Teeth of Dog.



Feet of Dogs; from F. Cuvier.

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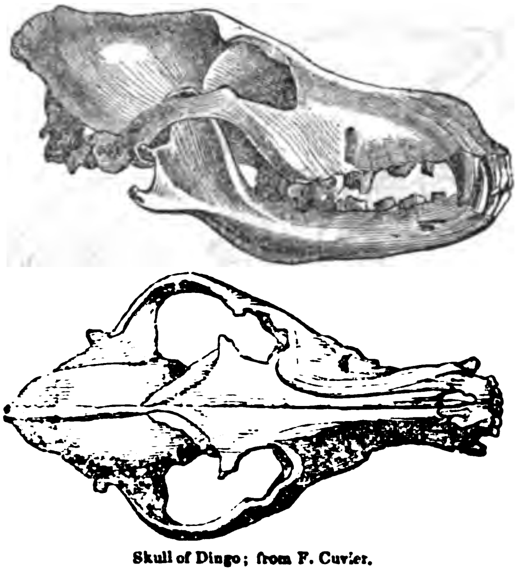
* M. F. Cuvier observes that these supernumerary teeth are developed in each jaw, but that he never saw them developed on each side in the same individual. When, for example, the left intermaxillary bone has a fifth false molar, the right intermaxillary bone has only the usual number; and it is the same with regard to the supernumerary tubercular tooth which is sometimes found in the upper jaw. As these modifications are not perpetuated, M. F. Cuvier places them among those casualties which give no foundation for the establishment of any rule.

Generally speaking, all dogs have five toes on the fore feet, and four on the hind feet, with the rudiment of a fifth metatarsal bone, which does not show itself externally. Nevertheless some dogs have this fifth toe very long and well proportioned, and advancing as far as the origin of the first phalanx of the neighbouring toe; and in those dogs which have only a rudimentary fifth bone of the tarsus, this bone articulates itself to the lower facet of the great cuneiform bone, which is itself placed in relation with the scaphöid bone, the second cuneiform bone, and the second bone of the metatarsus, counting as one the rudiment in question. But in the dogs that have the fifth toe complete, a fourth cuneiform bone is developed between the first and the second toe, and in that case, in some varieties, the great cuneiform bone elevates itself, and on its internal side offers a large articulating facet to the astragalus.

The tail is very variable in the number of caudal vertebræ which range from twenty-one down to three or even two.

In following out our inquiry as to the domesticated dog, we naturally seek for that variety which is found with man in his most uncivilized state, as the point of commencement. Some of the New Hollanders, perhaps, approach nearer to the state of nature than any other savages. Let us see what dog is associated with these people.

The New Holland dog, or as it is more generally termed, the Australian dog or Dingo, is so wolf-like in its appearance, that Bewick figures it as 'the New South Wales wolf.' Governor Phillip describes the height of this species, when standing erect, as rather less than two feet, and the length two feet and a half. The head, he says, is formed much like that of a fox, the ears short and erect, with whiskers from one to two inches in length on the muzzle. The general colour of the upper parts is pale brown, growing lighter towards the belly; the hind part of the fore-legs, and the fore part of the hinder ones white, as are the feet of both: the tail is of a moderate length, somewhat bushy, but in a less degree than that of a fox: the teeth, he adds, are much the same as is usual in the genus.



Skull of Dingo; from F. Cuvier.

This description may be considered as accurate, with the exception that the animal generally bears a greater affinity to the wolf than the fox. 'It has,' says the author last quoted, describing a female, 'much of the manners of the dog, but is of a very savage nature, and not likely to change in this particular. It laps like other dogs, but neither barks nor growls if vexed and teased; instead of which, it erects the hairs of the whole body like bristles, and seems furious: it is very eager after its prey, and is fond of rabbits or chickens raw, but will not touch dressed meat. From its fierceness and agility it has greatly the advantage of other animals much superior in size; for a very fine French fox-dog being put to it, in a moment it seized him by the loins and would have soon put an end to his existence had not help been at hand. With the utmost ease it is able to leap over the back of an ass, and was very near worrying one to death, having fastened on it so that the creature was not able to disengage himself without assistance; it has also been known to run down both deer and sheep. A second of these is in the possession of Mr. Lascelles, of which we have received much the same account in respect of its ferocity; whence it is scarcely to be expected that this elegant animal will ever become familiar.'

Dampier, in his voyage to New Holland (1699), well describes the Dingos, where he says that his men saw two or three 'beasts like hungry wolves, lean like so many skeletons, being nothing but skin and bones.' Indeed ill-treatment of the dog seems to be the characteristic of savage or semi-barbarous nations. Thus Lawson, in his *History of Carolina*, 'When all the viands were brought in, the first figure began with kicking out the dogs, which are seemingly wolves, made tame with starving and beating, they being the worst dog-masters in the world; so that it is an infallible cure for sore eyes ever to see an Indian's dog fat.' Among the oriental nations the natives of Java seem to treat their dogs almost as scurvily as the wild American Indians did in Lawson's time. (DEER, vol. viii., p 362-3.) To return to the Dingo. Mr. Bennett, in his *Gardens and Menagerie of the Zoological Society*, vol. i. (1830), thus writes:—'The specimens in the Garden appear to have shaken off some of their original wildness, and to have begun to accustom themselves in some degree to the circumstances in which they are placed. One of them has been for nearly two years in the Society's possession: the second is a much later acquisition.' This is remarkable as indicative of an approach to greater domestication, but the following statement by Mr. Bell, in his work above quoted (1836), carries this much farther, and enables us to trace the first effect of the more mild dominion of man upon this wolf-like dog. 'The effect of domestication in producing variation in colour, to which allusion has already been made, has lately been exhibited in a very striking and interesting manner in the menagerie of the Zoological Society. An Australian bitch, or *Dingo*, had a litter of puppies, the father of which was also of that breed: both of them had been taken in the wild state, but were of the uniform reddish brown colour which belongs to the race, and the mother had never bred before; but the young, bred in confinement, and in a half domesticated state, were all of them more or less spotted.

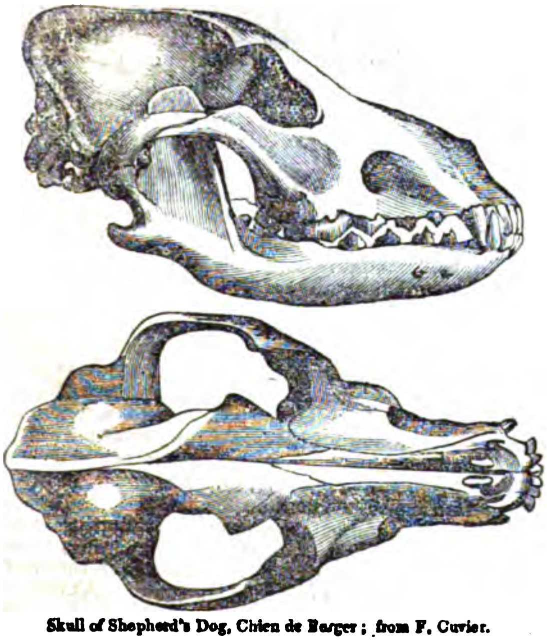
Dingo, Canis familiaris Australasiæ.

'If we turn to the dogs of other comparatively uncivilized nations we find the prick ears and other indications of a half reclaimed animal. The Esquimaux dog, *Canis familiaris Borealis*, and the Hare-Indian, or Mackenzie River dog, *Canis familiaris Lagopus*, will occur as instances to those who have been familiar—and who are not?—with the histories of our northern expeditions, and the garden of the Zoological Society of London in the Regent's Park. In that menagerie the three dogs last named might at one time be seen side by side, affording the best opportunities for comparison. Peter, the Esquimaux dog, kept in the garden, was of a dingy white with a tinge of yellow on the upper parts, gradually fading away upon the sides, in short, of nearly a uniform colour, but in general the race exhibits a predominance of black markings. The Akshelli brought from the Polar sea by Mr. Richards in Captain Parry's first voyage, and described by Mr. Children in the Zoological Journal, was almost entirely blackish, or of a colour nearly approaching to black on the upper parts and white underneath, tail included. Akshelli seldom barked, but, if displeased, uttered a low wolfish growl, and was a very powerful dog. Peter was brought to this country by Lieut. Henderson, one of the companions of Captain Ross, in his first voyage, and lived long at the Regent's Park. He was very good tempered and familiar. The Hare-Indian dogs, it is said, are never known to bark in their own country, and it is worthy of note that those which were brought from thence to the Regent's Park never barked at all, but the younger one which was born here barked like the other dogs. It is curious to observe these steps. 'The period,' says Mr. Bell, 'at which the domestication of the dog first took place is wholly lost in the mist of antiquity. The earliest mention of it in the sacred Scripture occurs during the sojourn of the Israelites in Egypt.—"But against Israel shall not a dog move his tongue." It is again mentioned in the Mosaic law in a manner which would seem to show that they were the common scavengers of the Israelitish camp, as they are still in many of the cities of the East:—"Neither shall ye eat any flesh that is torn of beasts in the field: ye shall cast it to the dogs." A similar office seems to be repeatedly alluded to in the course of the Jewish history:—"Him that dieth in the city shall the dogs eat, and him that dieth in the fields shall the fowls of the air eat:" a common curse, as it would appear, as it occurs verbatim on no less than three separate occasions in the First Book of Kings; and evidently intimates a violent and disgraceful death, without the honour of sepulture. The dog was considered by the Jews as eminently an unclean animal, and was the figure selected for the most contemptuous insults. It is impossible not to be struck with the striking similarity which exists in the feelings of many oriental nations at the present day, among whom the very phraseology of the Scriptures is, with little modification, applied to a similar purpose.

Before we proceed to give a sketch—and our limits will allow us to give no more—of the varieties of the dog as fostered by man, we must say another word as to its origin. The student should be on his guard against being led to a conclusion as to that origin by any particular developments of parts. No animal seems to be more susceptible of modification than the dog, and man has succeeded in producing almost every degree of change in the form of its cranium, its stature, its aspect, and its fur. With regard to the latter it is, in some varieties, almost entirely absent, and we have seen, on the other hand, good close *wool* from a curious variety of the poodle.

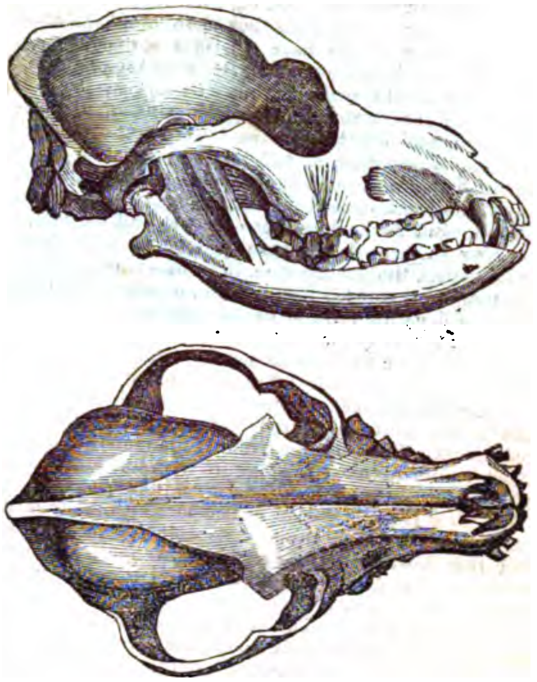
One circumstance should be borne in mind throughout an inquiry into the origin of the dog. None of the wild dogs, however, apparently living in a state of nature, have ever been found to return to the true form of wolf.

The shepherd's dog, a variety which was most probably one of the first that civilized and settled man called in aid to preserve his flocks from beasts and birds of prey and the depredations of roving human tribes, is remarkable for the capacity of its cranium and its great sagacity.

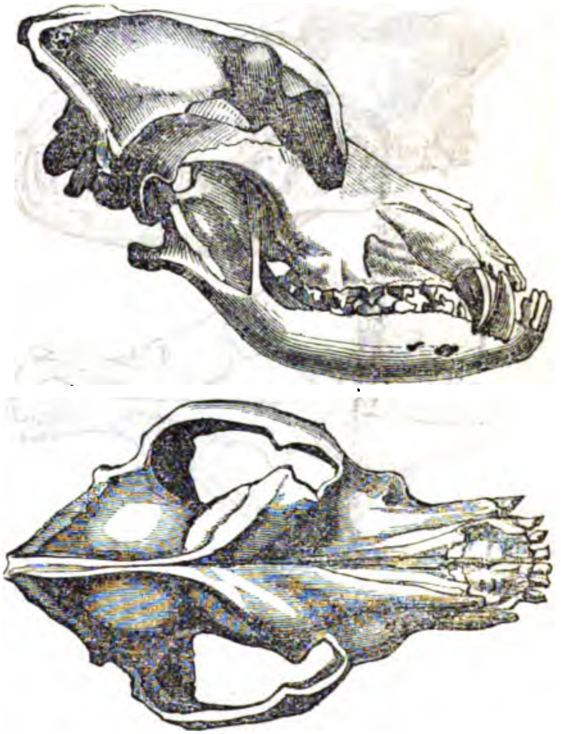


Skull of Shepherd's Dog, Chien de Berger; from F. Cuvier.

It is indeed distinguished by this cranial development even above the spaniels and their varieties, and the hounds which comprise the most useful and intelligent dogs. In the bull-dogs and mastiffs, 'dogues de forte race,' of the French, though the head is one-third larger than those of the shepherd's dog and of the spaniels, 'Barbets,' the cranial *capacity* is not by any means so great.



Skull of Spaniel; from F. Cuvier.

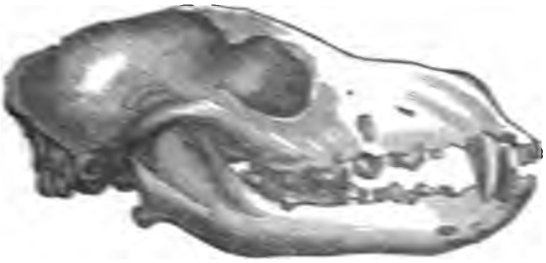


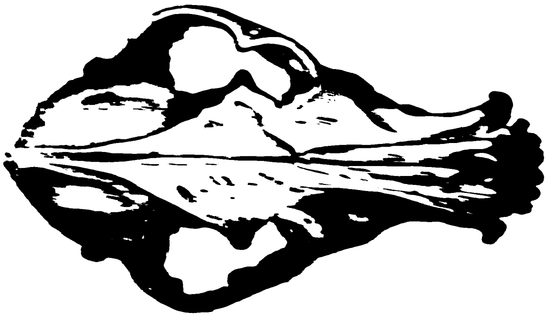
Skull of Dogue de forte race; from F. Cuvier.

Dr. Caius, the physician of queen Elizabeth's time, wrote several papers on Natural History for the use of Gesner, his correspondent and friend. In one of these treatises he divides the British dogs into—1st. *The most generous kinds*, which he subdivides into the *dogs of chace*, including the *Hounds*, viz., the *Terrier*, *Harrier*, and *Bloodhound;* and the *Gazehound*, *Greyhound*, *Leviner*, or *Lyemmer*, and *Tumbler:*—*The Fowlers*, viz. the *Spaniel*, *Setter*, *Water-spaniel*, or *Finder:*—and the *Lap Dogs*, viz. the *Spaniel Gentle*, or *Comforter*. 2nd. The *Farm-Dogs*, viz. the

Shepherd's Dog, and the *Mastiff* or *Band-dog*. 3rd. *Mongrels*, viz. *Wappe*, *Turnspit*, and *Dancer*.

Bewick enumerates the following:—The *Shepherd's Dog*, the *Cur Dog*, the *Greenland Dog*, the *Bull-dog*, the *Mastiff*, the *Ban-dog*, the *Dalmatian* or *Coach-dog*, the *Irish Greyhound*, the *Highland Greyhound*, the *Gazehound*, the *Greyhound*, the *Italian Greyhound*, the *Lyemmer*, the *Lurcher*, the *Tumbler*, the *Terrier*, the *Beagle*, the *Harrier*, the *Fox-hound*, the *Old English Hound*, the *Kibble Hound*, the *Blood Hound*, the *Spanish Pointer*, the *English Setter*, the *Newfoundland Dog*, the *Rough Water Dog*, the *Large Water Spaniel*, the *Small Water Spaniel*, the *Springer*, or *Cocker*, *King Charles's Dog*, the *Pyrame Dog*, the *Shock Dog*, the *Lion Dog* (a small and rare variety), the [illegible], the *Turnspit*, and the *Pug*. We [illegible] this list, which is [illegible]. The [illegible] *Mastiff*, *Bull-dog*, &c.





Skull of [illegible]

We give the figure of the Thibet Dog as a fine example of the Mastiffs. Dr. Wallich [illegible] the dogs which

The Thibet Dog, [illegible]

[illegible]

[illegible] haunts of man. They sometimes come [illegible]

trate as far as Calcutta. On these occasions the women remain at home with the dogs, and the encampment is watched by the latter, which have an almost irreconcileable aversion to Europeans and in general fly ferociously at a white face. A warmer climate relaxes all their energies, and they dwindle even in the valley of Nepaul.' Those which were in the Zoological Society's Garden in the Regent's Park died soon after their arrival. They were considered very great rarities, and were brought over to this country by Dr. Wallich. The Hon. Edward Gardner, British resident at the court of the Rajah of Nepál, never heard of any other instance of this variety being domesticated by Europeans.

In all the varieties the period of gestation is sixty-three days. The litter is generally numerous, often as many as eight or nine. The whelps are born blind and do not see till nine days are fully expired; they sometimes see on the tenth, and sometimes not till the twelfth day. At the fourth month the teeth begin to change, and at two years the growth of the animal is considered complete. A dog is considered old at the expiration of five years, and the limits of its existence rarely exceed twenty years.

It is confidently stated that in all the varieties of a dog [illegible] tail [illegible]

Those who would pursue their inquiries as to the varieties of dogs [illegible] *The Sportsman's Cabinet* [illegible] *Daniel's Rural Sports* [illegible] *The Naturalist's Library* [illegible] Sir John Sebright's interesting and [illegible] this article.

Fossil Dogs.

It may be doubted whether any fossil remains of the Dog, properly so called, have ever been found. The occurrence of the bones of the wolf and the fox in the ossiferous caverns is well known; but in pursuing this part of the inquiry it should be remembered how difficult it is to distinguish the bones of the wolf from those of the [illegible] and the Shepherd's Dog. The [illegible] of Goldfuss, the remains of which were found at [illegible] the wolf in general [illegible] The Agnotherium of Kaup is [illegible] to have been as large as a lion, and [illegible] to the dog.

DOGE was the title of the first magistrate of the republic of Venice. The first settlers in the islands of the lagune were governed by magistrates sent from Padua. [illegible]

[illegible] assumed by degrees the

power of electing a doge in order to put a stop to the frequently recurring tumult and anarchy; the choice however was subject to confirmation by the assembly of the people. The first doge thus elected was Sebastiano Ziani in 1173, and the forty made him swear to a new constitution, or fundamental law, by which, instead of the general assembly of the people, the sovereign power was vested in a great council of 470 citizens elected for one year, but capable of indefinite re-election. These were chosen by twelve electors, two for each sestiere, or district, of the city of Venice alone, who were themselves appointed by the inhabitants of their respective districts, the other islands and territories of the republic having no part in the elections. The Great Council was to appoint six individuals who were to be the doge's counsellors, without whose concurrence no act of the doge should be valid. This council was afterwards called 'la Signoria.' In important cases the doge was to consult with another council of sixty members, called Pregadi, or 'requested,' taken also from the Great Council. This is the body which in course of time became invested with all the powers of the state, and is generally known by the name of the Venetian Senate. The citizens of Venice, weary of tumult, and being secured in the exclusive right of furnishing the members of the Great or Sovereign Council, seem to have willingly acquiesced in these constitutional changes, and a distribution of golden pieces made by the new doge served to gratify the populace. About a century after, another organic change took place. Pietro Gradenigo being elected doge in 1289, by the influence of the old or aristocratic families, proposed a law which passed the Great Council in 1298 after much opposition and delays, that no one should in future be eligible to sit in that assembly except those who then had a seat in it, or whose fathers, grandfathers, and great-grandfathers, had been members of it. The number of the members of the Great Council was no longer limited to 470. Lastly, in 1319 a new law passed the Great Council, by which that assembly declared itself permanent and hereditary, all the members who were then sitting in it (about 600 in number) remaining for life in possession of their seats, their sons who were above twenty-five years of age being likewise admitted, and their descendants after them, to the exclusion of all other families. This decree, known in history as 'la serrata del maggior consiglio,' established an hereditary and exclusive aristocracy at Venice, which lasted till the end of that republic. The confirmation of the doge by the people was henceforth dispensed with. The doge himself became merely a state pageant, the servant of the councils, which had the power of trying and deposing him, and even sentencing him to death. They took away from him the command of the military and naval forces, his children were excluded from every office of state, and he had no patronage except the prebendal stalls of the cathedral of St. Mark. The doge was president by right of all the councils, with a double, or casting vote. He was simply addressed by the title of Messer Doge. (*Memorie Venete* di Giovanni Gallicioli, Venice, 1816; Daru, *Histoire de Venise*, books 6 and 39; and an article in the *Edinburgh Review*, No. 91, June, 1827.)

The doges at Genoa were at first magistrates for life [BOCCANERA], as at Venice, but the frequent contentions and civil factions among the aspirants to that dignity induced Andrea Doria, in his reform of 1528, to make the office of doge to last only two years. [DORIA.]

DOGGERBANK, a very extensive sand-bank in the North Sea, lying between the east coast of England and the west coast of Holland, and situated between the Well-bank and the Broad-fourteen. The western part of the Doggerbank is about twelve leagues east from Flamborough-head, in the east riding of Yorkshire, whence the bank extends in a direction nearly E.N.E. to within twenty leagues of Jutland. In some places this bank is twenty leagues broad, but it is contracted towards the east, and terminates nearly in a point. The shoalest part is that nearest the English coast, where it has nine fathoms water, so that it presents no dangers or difficulties in navigation; in other parts the surface rises generally towards the centre: in some places the depth of water is as great as twenty-seven fathoms.

The Doggerbank is a noted station for the cod fishery, and is much frequented by both English and Dutch fishermen. It is also known in history as the scene of an obstinate naval engagement which took place in the summer of 1781 between the English and Dutch fleets under the respective commands of Admirals Parker and Zoutman. The disabled condition of the ships on both sides put an end to the battle, in which neither side could claim a victory.

DOGMA (δόγμα), a word borrowed from the Greek, means an established principle, a fundamental article of belief derived from undisputed authority, and is generally applied to the essential doctrines of Christianity which are drawn from the Scriptures or from the authority of the Fathers. Hence that branch of divinity called dogmatic theology is an exposition and assertion of the various articles of the Christian faith as founded upon authority acknowledged by Christians in general, and is distinguished from scholastic theology, which assumes to establish the truth of the Christian doctrines by argument. John Damascenus was one of the first who wrote an exposition of Christian dogmatics. [DAMASCENUS.] But although the authority of the Scriptures and of the early fathers is acknowledged by all Christians, there are other authorities which are acknowledged only by one communion, and not by others. Thus the Greek church acknowledges the authority of the earlier councils only, while the Roman Catholics look upon the later councils and the bulls and decretals of the Popes as equally positive authority in matters of faith; and the Protestant and reformed churches, rejecting the latter, recur to their respective Synods and confessions of faith. Melancthon wrote a concise exposition of the dogmas of the Protestant or Lutheran church. Among the numerous Roman Catholic writers on dogmatic theology, Bellarmine is one of the most distinguished. Dogmatic theology, as distinct from scholastic as well as from moral theology and Biblical divinity, constitutes a separate chair in several Roman Catholic universities in continental Europe.

In the Protestant Universities of Germany there is a chair for the history of dogmas. The business of the professor is to examine the doctrines of the various sects which have divided Christianity, their sources, and the arguments by which they are supported. Such a course of lectures forms an important addition to the study of Ecclesiastical History.

DOG'S-BANE, the English name of the poisonous plant called by botanists Apocynum.

DOG'S-TAIL GRASS. [CYNOSURUS.]

DOGWOOD, the English name of various deciduous-leaved shrubs belonging to the genus Cornus. [CORNACEÆ.] They are cultivated as ornamental plants, for the sake of their bright red shoots, which are an embellishment of plantations in the winter; and also for the sake of the charcoal obtained from them, which is one of the best sorts for the manufacture of gunpowder.

DOIT or **DUYT**, a small Dutch copper coin, being the eighth part of a stiver, in value half a farthing. Doit is also a division of the English grain Troy. See Snelling's 'View of the Coins of Europe,' 8vo. London: 1766. Kelly's 'Complete Cambist,' i. 219; ii. 279. The word is used by Shakspeare, *Coriolanus*, act i., sc. 5.

DOL. [ILLE ET VILAINE.]

DOLABELLA. (Malacology.) [TECTIBRANCHIATA.]

DOLABRIFORM, a term applied in botany to certain fleshy leaves, which are straight at the front, taper at the base, compressed, dilated, rounded, and thinned away at the upper end at the back, so as to bear some resemblance to an old fashioned axe-head.

DOLCI, CARLO, an excellent painter, was born at Florence, on Thursday, May 25, 1616. His father Andrew, and his mother's father and brother, Pietro and Bartolomeo Marinari, were all painters, and much esteemed and respected in their native city. At the age of four years, Carlo had the misfortune to lose his father, and his mother was obliged to maintain a numerous family by her industry. At the age of nine she placed him with Jacopo Vignali, a pupil of Roselli, who was famous for his powers of teaching. In four years Carlo could paint. His first efforts attracted the notice of Piero de' Medici, an amateur, who procured him the notice of the court, and he soon became very busily and profitably employed. In 1654, by the advice of his friends, he married Theresa Bucherelli, by whom he had a numerous family. About 1670 he was invited to paint the likeness of Claudia, the daughter of Ferdinand of Austria, at Innspruck, which place he visited for a short time. After his return he was afflicted with melancholy, and he died on Friday, January 17, 1686, leaving one son in holy orders, and seven daughters, of whom

Agnese, married to Carlo Baca, a silk merchant, painted in the manner of her father.

Dolci's biographer, Baldinucci, attributes his excellence in painting to the goodness of Heaven, as a just reward for his singular piety, in illustration of which numerous anecdotes are told. When invited to take Claudia's portrait, he declined for fear of the length of the journey, never having lost sight of the cathedral dome and campanile of his favourite city since his birth; and his assent was only procured by obtaining the commands of his confessor, which he obeyed at once. In like manner he was recovered from his first fit of melancholy by the command of his confessor to proceed with a picture of the Virgin. He appears to have been extremely good and amiable, but singularly timid. His last illness was brought on by a remark which Luca Giordano uttered in joke, according to his intimate friend Baldinucci, that his slowness would never allow him to amass 150,000 dollars as the expeditious Giordano had done, but that he must starve. Upon this, poor Carlo seems to have grown bewildered; he decried the works of the other, whom he thought to be taking the bread out of his mouth, and refused food for some time. In the midst of his troubles, his excellent and beloved wife died, and death soon released him from his grief. In all his insanity he was never violent, but dejected and helpless, and as obedient as a child to his ghostly adviser.

From his first attempts at painting, Carlo determined to paint none but sacred subjects, and he almost literally observed this rule. His style is pleasing, and full of gentle and tender expressions; his drawing for the most part, but not always, correct; his colouring varied, soft, bright, and harmonious; sometimes too pearly in its tint. Lanzi traces in his painting something of the manner of Rosselli, who was, as it were, his grandfather in art. He elaborated all he did with the most consummate patience and delicacy. His pictures are numerous, and found in many collections, for he painted many duplicates, and many copies were made by his pupils Alessandro Lomi and Bartolomeo Mancini, and Agnese, his daughter. Onorio Marinari, his cousin and scholar, gave great promise, but died young. (Baldinucci.)

DOLCIGNO, or DULCIGNO, in the Albanian tongue DULTZUNE, and in the Turkish OLGUN, a town in Upper Albania, near Scutari. [ALBANIA.] This town is on the coast, and has a good harbour. The inhabitants, who amount to about 6000, are engaged partly in commerce, but chiefly in piracy. They were regarded till of late as the most formidable pirates of the Gulf of Venice. Some of their seamen enter into the service of the Barbary States. This town, or perhaps Dulcigno Vecchie, which Mr. Hobhouse (in the map prefixed to his Travels) places on the coast, five or six miles more to the north, was antiently called Olcinium, a name containing the same elements as the modern Albanian and Turkish names; the Illyrians of Olcinium followed the same piratical course as the modern Dulcignotes. (Hobhouse, *Travels in Albania*.)

DOLE, a town in France, in the department of Jura, on the north-west bank of the Doubs, a feeder of the Saône, and on the road from Paris to Geneva. It is about 190 miles in a straight line south-east of Paris, in 47° 7′ N. lat. and 5° 28′ E. long.

Dole is not clearly identified with any Roman site; but in the town and its environs vestiges of the Romans have been traced. In the middle ages, while Besançon was yet a municipal republic, Dole was considered as the capital of La Comté de Bourgogne, or La Franche Comté. It was taken and almost destroyed by the French in 1479. It was again attacked by the French, under the Prince of Condé, in 1536. In 1668, La Franche Comté having been conquered by the French, the ramparts of Dole were rased, but repaired by the Spaniards, to whom the town was restored by a treaty of peace the same year. At a subsequent period, after La Franche Comté had come finally into the hands of the French, they were finally demolished.

The town is pleasantly situated, but its streets are steep, and the houses poor and irregularly built. The church of Nôtre Dame is worthy of notice, and there is a pleasant promenade. The population, in 1832, was 7304 for the town, or 9927 for the whole commune. The inhabitants carry on a trade in corn, wood, and iron; they manufacture hosiery and glass. There are iron-works and coal-mines in or near town. There are a library, a high school, an agricultural society, and a theatre. There is also a prison at Dole.

Dole is the capital of an arrondissement, which had in 1832 a population of 72,992.

DOLGELLY. [MERIONETHSHIRE.]

DO'LICHONYX. [BOB-O-LINK; EMBERIZIDÆ.]

DO'LICHOS. Under this name Linnæus included the greater part of those tropical twining leguminous plants which bear eatable fruit like the kidney-beans cultivated in Europe. A large number of species, ill distinguished from each other and differing materially in the structure of their fructification, were for so long a time collected under this name that, although they are now broken up into several genera, we shall briefly notice the more remarkable in this place.

Dolichos itself is confined to the species with a compressed linear pod, having incomplete cellular dissepiments, and ovate seeds with a small oval hilum. Of these D. *Catjang*, the pulse of which is called Boberloo in India, is an annual, and has somewhat deltoid leaves angular at the back, few-flowered peduncles, and erect pods; it is cultivated in the fields in many parts of India during the dry season, and its seeds are extensively consumed by the poorer natives. *D. lignosus*, a perennial, with long racemes of flowers, broad heart-shaped leaflets, and linear sharp-pointed pods, is extremely common all over India, where it is cultivated 'during the cold season in gardens and about the doors of the natives, forming not only [illegible] shady arbours, but furnishing them with an excellent pulse for their curries,' &c. There are several varieties of it constituting the commonest kidney-beans of India. *D. biflorus*, an annual, with oblong pointed leaflets and scimitar-shaped hairy pods, furnishes the pulse called in India horse-gram; and *D. sphærospermus* produces the Calavana or black-eyed peas of Jamaica.

Lablab has a compressed scimitar-shaped pod, rough with tubercles at the sutures, and furnished with transverse imperfect cellular partitions, and ovate seeds with a fungous callous linear scar. *Lablab vulgaris*, the old *Dolichos Lablab*, is a common plant in the hedges in many parts of India, whence it has travelled into the tropical parts of America. It is a smooth perennial with showy white or purple flowers, and large horizontal pods, containing from three to four seeds. It has a heavy disagreeable bug-like smell, prefers a rich black soil that cannot be flooded by rains, and produces a coarse but wholesome pulse, much eaten by the lower classes in India.

Pachyrhizus has a long compressed pod, with kidney-shaped seeds and no dissepiments, and is remarkable for its principal species, *P. angulatus* (formerly *Dolichos bulbosus*), producing a root of the size and substance of a turnip. It is reported to have been carried to the Philippines from South America, and thence to have been introduced into the west of Asia. The side leaflets are nearly triangular, that in the middle lozenge-shaped, slightly toothed, and shaggy on both sides. The flowers are very beautiful, of a violet blue colour, and arranged in axillary nearly erect racemes, from one to two feet long. Its root is a common article of food in the Malay archipelago, but no other part of the plant is eaten.

In *Psophocarpus* the pods are oblong, and have four longitudinal wings; the seeds are roundish. It comprehends the *Dolichos tetragonolobus*, a twining annual, the pods or tuberous roots of which are a common Indian esculent.

Canavalia, with long straightish compressed pods, having three short wings at the lower suture, cellular dissepiments, and oblong seeds with a narrow hilum, comprehends the South American Lima beans and the Sword beans of India. The species have a handsomer and firmer foliage than the other genera, and the flowers are usually large and showy. *C. gladiata*, the common cultivated species, has often pods as much as two feet long, and varies with red, grey, and white seeds.

Finally, the genus *Mucuna*, known by its oblong puckered compressed hispid pods, includes all the species from which Cowhage is obtained. [COWHAGE or COWITCH.]

DOLI'OLUM. [DIPHYDES, vol. ix., p. 11.]

DO'LIUM. [ENTOMOSTOMATA.]

DOLLAR. [MONEY.]

DOLLOND, JOHN, an eminent optician, was descended from a French refugee family, settled in Spitalfields, and born on the 10th of June, 1706.

His parents were in humble circumstances, his father being an operative silk weaver; and the man who was detined to add so important a discovery to our knowledge of the laws of light was compelled to spend his boyhood in the drudgery of a manufactory, and in a capacity which had nothing congenial to his tastes. The little leisure however which he had was spent in the acquisition of a varied circle of knowledge. Besides the study of mathematics and physics, to the latter of which his reputation is chiefly due, he studied anatomy and natural history in general, on one hand, and theology and ecclesiastical history on the other. In furtherance of this diversified class of subjects, which, considering the toil to which the day was devoted, was sufficiently extensive, he undertook the Greek and Roman classics; he was partially acquainted with several of the modern languages, but with French, German, and Italian, he was intimately conversant. It is very rare to see the happy union of great powers of reasoning, of memory, and of observation, that was displayed by this eminent man.

Notwithstanding the cares of a family and the duties which it imposed upon him, Dollond still found means to cultivate the sciences; and having apprenticed his eldest son, Peter, to an optical instrument maker, he was in due time able to establish him in business in Vine Court, Spitalfields. In this business he finally joined his son, for the especial purpose, it would seem, of being able to unite his tastes with his business more perfectly than silk weaving enabled him to do.

Immediately on this arrangement being completed, Dollond commenced a series of experiments on the dispersion of light, and other subjects connected with the improvement of optical instruments, and especially of telescopes and microscopes, the results of which were communicated to the Royal Society in a series of papers. Three of them were printed in the Philosophical Transactions for 1753, one in 1754, and the last in 1758, the titles of which are given below. It was about 1757 that he entered upon a systematic course of experiments on dispersion, and after, to use his own words, 'a resolute perseverance' for more than a year and a half, he made the decisive experiment which showed the error of Newton's conclusions on this subject. [Light.]

The memoir in which the series of investigations was detailed appeared in the Philosophical Transactions, and was the last which he gave to the world. It was rewarded by the council of the Royal Society with the Copley medal.

It was the lot of Dollond to undergo considerable annoyance on account of the claims set up for this discovery in favour of others, especially of Euler; but there is not a shadow of a doubt of Dollond's priority as well as originality, in this very important discovery, left on the minds of the scientific world. The discrepancies which followed the application of Newton's doctrine to the varied facts that presented themselves in the course of different experiments might, in speculative minds, have created a suspicion of the accuracy of that doctrine; yet there does not appear to have been the least hesitation among scientific men in attributing these discrepancies to *errors of observation exclusively*, and consequently not the least ground for honestly attempting to deprive Dollond of the honour of the discovery.

In the beginning of the year 1761 Dollond was elected a Fellow of the Royal Society, and appointed optician to the king. He did not long survive to enjoy the honour or advantages of his discoveries; as, on the 30th of September of that year, he was attacked by a fit of apoplexy, brought on by a too close and long continued application to a paper which he was studying. This attack immediately deprived him of speech, and in a few hours of life itself.

Besides his eldest son Peter, already mentioned, he left another son and three daughters. The two sons carried on the business jointly with great reputation and success; and upon the death of the younger, it went into the hands of a nephew, who took the family name, and who still carries it on without diminution of the high character attached to the name of Dollond.

Mr. Dollond's appearance was somewhat stern, and his address and language impressive; but his manners were cheerful, kind and affable. He adhered to the religious doctrines of his father, and regularly attended the French Protestant Church, of which his life and conversation rendered him a bright ornament.

The following is the list of Dollond's published papers:—

1. A letter to Mr. James Short, F.R.S., concerning an Improvement in Refracting Telescopes; *Phil. Trans.*, 1753, p. 103.
2. Letter to James Short, A.M., F.R.S., concerning a mistake in Mr. Euler's Theorem for correcting the Aberration in the Object Glasses of Refracting Telescopes; *Phil. Trans.*, 1753, p. 287.
3. A Description of a Contrivance for measuring Small Angles; *Phil. Trans.*, 1753, p. 178.
4. An Explanation of an Instrument for measuring Small Angles; *Phil. Trans.*, 1754, p. 551.
5. An account of some experiments concerning the different Refrangibility of Light; *Phil. Trans.*, 1758, p. 733.

DOLOMIEU, DEODAT GUY SILVAIN TANCREDE DE, was born at Grenoble on the 24th of June, 1750. In early youth he was admitted a member of the religious order of Malta, but in consequence of a quarrel with one of his companions, which ended in a duel fatal to his adversary, he received sentence of death, but, after imprisonment, he was pardoned, and went to France. After some hesitation whether he should devote himself to classical literature or to natural history, he decided in favour of the latter. While at Metz with the regiment of carbineers, in which he had obtained a commission, he formed an acquaintance with the celebrated and unfortunate La Rochefoucauld, which ceased but with his existence; and the attachment for science, by which this nobleman was distinguished probably contributed to confirm Dolomieu in the choice of the pursuit which he had previously made. He was soon afterwards elected a corresponding member of the Academy of Sciences, and quitted the military profession.

At the age of twenty-six he went to Sicily, and his first labour was an examination of the environs and strata of Ætna. He next visited Vesuvius, the Appennines, and the Alps, and in 1783 published an account of his visit to the Lipari islands.

He returned to France at the commencement of the Revolution, and early ranged himself on the side of liberty. He had however no public employment until the third year of the republic, when he was included in the *École des Mines*, then established; and he was one of the original members of the National Institute, founded about the same time. He was indefatigable in the pursuit of geological and mineralogical science, and in less than three years he published twenty-seven original memoirs; among which were those on the nature of *leucite*, *peridot*, *anthracite*, *pyroxene*, &c.

When Bonaparte undertook the conquest of Egypt, Dolomieu accompanied the expedition; on the arrival of which he visited Alexandria, the Delta, Cairo, the Pyramids, and a part of the mountains which bound the valley of the Nile. He proposed also to explore the more interesting parts of the country; but before he could carry his plan into execution his health became so deranged that he was compelled to return to Europe. On his passage home he was, with his friend Cordier, the mineralogist, and many others of his countrymen, made prisoner after being driven into the Gulf of Tarentum, and confined in a miserable dungeon. His companions were soon set at liberty, but the remembrance of the disputes which had existed between him and the members of the Order of Malta led to his removal and subsequent imprisonment at Messina, where he was confined in a dungeon lighted only by one small opening, which, with barbarous precaution, was closely shut every night. The heat, and the small quantity of fresh air admitted by the window of his prison, compelled him to spend nearly the whole of his time in fanning himself with the few tattered remnants of his clothes, in order to increase the circulation of the air.

Great exertion and urgent demands were made by the scientific men of various countries to obtain his enlargement; and when, after the battle of Marengo, peace was made with Naples, the first article of the treaty was a stipulation for the immediate release of Dolomieu. On the death of Daubenton he was appointed professor of mineralogy, and soon after his return to France he delivered a course of lectures on the philosophy of mineralogy at the Museum of Natural History.

In a short time he again quitted Paris, visited the Alps, and returned to Lyon by Lucerne, the glaciers of Grindelwald and Geneva, and from thence to Châteauneuf, to visit his sister and his brother-in-law De Drée: here he was unfortunately attacked by a disorder which proved fatal in the 52nd year of his age.

He had projected two journeys for adding to his vast store of geological knowledge, the first through Germany, and the second through Norway, Denmark, and Sweden. He also proposed to publish a work which he had planned in his prison at Messina; of this he printed a fragment on *Mineral Species*, which is a monument at once of his misfortunes and his genius, being written in his dungeon in Sicily, on the margin of a few books with a bone sharpened against his prison walls for a pen, and the black of his lamp smoke mixed with water for ink. In this work the author proposes that the integral molecule shall be regarded as the principle by which the species is to be determined, and that no other specific characters should be admitted than those which result from the composition or form of the integral molecule. It must however be admitted as an objection to this proposal that the integral molecule is not always easily ascertained or characterized.

'From a careful perusal of the works of Dolomieu,' observes Dr. Thomson, *Annals of Philosophy*, vol. xii., p. 166, 'especially his later ones, the following appear to be the results of his observations and the bases of his geological system:

'It appears highly probable, from geometrical considerations and from the theory of central forces, that the earth at the time when it received its spheroidal shape was in a state of fluidity. This fluidity was probably neither the result of igneous fusion nor of aqueous solution, but of the intermixture of a substance or substances with the earthy particles fusible, like sulphur, at a moderate heat, capable of entering into more rapid combustion when exposed to the air, decomposing water, and involving the gas thus produced so as to enter into strong effervescence when the superincumbent pressure does not exceed a given quantity.

'The surface of this fluid, by the action of the air on the combustible ingredient which occasioned its fluidity, would at length become consolidated, and would envelop the whole spheroid with a shell of less specific gravity than the fluid part, and therefore floating securely on its surface; this latter essential condition being rendered extremely probable from the well-known fact, that the mean specific gravity of the globe is considerably greater than that of any natural rock hitherto known.

'The interposition of this solid shell of stony matter, a bad conductor of heat, between the liquid and gaseous portions of the globe, would enable the aqueous and other easily-condensible vapours to separate themselves from the permanently-elastic gases, and thus the matter of the globe would be arranged in four concentric spheroids according to their respective gravities: namely, the liquid central portion, the solid stony, the liquid aqueous, and the permanently elastic. As the water penetrated through the stony portion to the nearest fluid part, it would be gradually decomposed, the consolidation would proceed downwards, the newly consolidated part would enlarge in bulk, and thus, aided by the elastic expansion of the hydrogenous base of the decomposed water, would occasion rifts of greater or less magnitude in the superincumbent mass. Some of the larger of these rifts would open a free communication between the ocean and the fluid central mass, a torrent of water would rush down, and the effervescence occasioned by its decomposition would produce the first submarine volcanos. The lava thus ejected would in time raise the mouth of the volcano above the surface of the water, when it would either become quiescent, or, if supplied laterally with a sufficient quantity of water, would assume the character of a proper volcano, or burning mountain. The secondary rocks, *i. e.* all those which either themselves contain organic remains or are associated with those which do, were deposited from solution or suspension in water. By the deposition of these, and the increase by consolidation of the primitive rocks, the thickness of the mass incumbent above the central fluid is continually increasing; and those causes which antiently broke through the solid crust of the globe are now rarely able to produce the same effect; hence the greater magnitude and frequency of volcanic eruptions in the earliest ages of the earth; for the same reason the elevation of large mountainous or continental tracts above the general level no longer takes place; and thus the surface of the globe has become a safe and proper habitation for man and other animals. If the land animals were created as early as possible, that is, while the great changes of the earth's surface above-mentioned were still in process, many of the most antient traditions of deluges and other catastrophes may be founded on fact.

'The fluidity of the central part of the globe, and its connection with the active volcanos, affords a plausible theory of earthquakes, and particularly accounts for the propagation of the shock, with diminishing intensity, to great distances.

'The crystals of hornblende, of felspar, &c., which occur so abundantly in most lavas, are, according to this theory, not those component ingredients of rocks which have resisted the heat while the other substances associated with them have been melted; nor are they the result of the slow cooling of a vitreous mass, but are produced by crystallization in the central fluid, and are accumulated, on account of their inferior specific gravity, about its surface, together with the peculiar inflammable matter in which they float, whence they are disengaged during volcanic eruptions.'

DOLOMITE, a variety of magnesian limestone first noticed by Dolomieu. It occurs mostly massive, and in mountain masses; it is usually white, sometimes greyish or yellowish; its structure is sometimes slaty; it is frequently translucent on the edges. It is softer than common limestone.

The Apennines are partly composed of dolomite, and it occurs at Iona. Sometimes it is met with in veins accompanied by quartz, carbonate of lime, &c. The dolomite of the Apennines consists of 59 carbonate of lime and 40 carbonate of magnesia: it contains a variable quantity of oxide of iron.

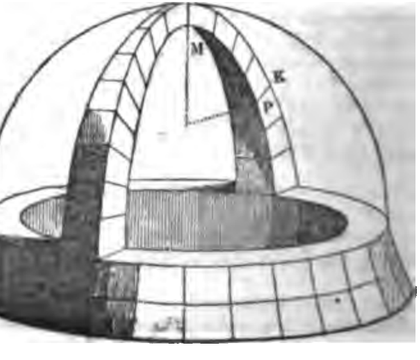
Compact Dolomite or *Gurhoffian* is snow white, and very compact. The surface, when newly broken, is scarcely shining, and the fragments, which are sharp, are translucent on the edges; the fracture is flat conchoidal, and its hardness is considerable. It occurs in veins traversing serpentine between Gurhoff (whence its name) and Aggsbach, in Lower Austria. According to Klaproth, it consists of carbonate of lime 70.50, and carbonate of magnesia 29.50.

DOLPHIN. [WHALES.]

DOMBES, a principality in France, to the east of the river Saône; one of the divisions existing before the Revolution. It consisted of two portions separated from each other by an intervening part of the district of Bresse by which the eastern portion was entirely surrounded. The western portion was bounded on the west by Lyonnois, Beaujolais, and Maconnois, from which it was separated by the river Saône; on the south, by the districts of Franc-Lyonnois and Bresse; and on the north and east by Bresse. It is now comprehended in the department of the Ain. It contained seven towns, among which were Trévoux, the capital, and Thoissey. Dombes was governed by sovereign princes of its own, who derived a considerable revenue from it, until the year 1762, when the reigning prince exchanged his principality for the duchy of Gisors in Normandy, and other lands. Dombes was united to the crown; but retained its 'parlement,' or local civil court.

DO'MBEYA, a name given by botanists to a Sterculiaceous genus of shrubs or trees inhabiting the East Indies and the Isles of France, Bourbon, and Madagascar. They have a five-parted persistent calyx, surrounded by a three-leaved unilateral involucel. The petals are five. The stamens are from fifteen to twenty, scarcely monadelphous, five of them being sterile, with from two to three fertile ones between each sterile stamen. The name Dombeya was also applied to the plant now called *Araucaria excelsa*.

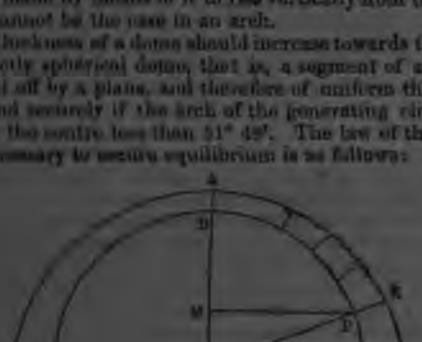
DOME. The mathematical theory of a dome, so far as considerations requisite for security are concerned, is more



simple than that of an arch. Imagine two vertical planes passing through the axis of a dome, and making a small angle with each other. These planes intercept on the arch two symmetrically opposite slices of the dome, which tend to support each other at the crown. This support might be made complete and effectual upon principles explained in the article Arch; so that in fact each small slice of the dome, with its opposite, might compose a balanced arch. Any slice of such a dome is supported by the opposite one only, so that all the rest might be taken away. Now suppose such a dome to be constructed upon an interior centering, of which however the arches are not separately balanced, in consequence of the weight of A P K being so great that the resultant of this weight and the horizontal thrust at A falls obliquely, not being, as in a balanced arch, perpendicular to P K, but cutting the line K P produced towards the axis. Still this dome cannot fall; for since every part of the horizontal course of stones has the same tendency to fall inwards, these pressures inwards cannot produce any effect, except a lateral pressure of each slice upon the two which are vertically contiguous. Hence the condition of equilibrium of a dome is simply this, that the weight of any portion A M P K must be too great for a balanced arch. Upon this same principle a dome may even be constructed with a concave exterior; and in a dome of convex exterior a portion of the crown may be removed, as is the case when the building is surmounted by a lantern. The tendency of the upper part to fall inwards being equal all round, each stone is supported by those adjacent.

From the preceding it appears that it would be (in comparison with an arch) easy to construct a dome with perfectly polished stones, and without cement. The friction of the stones and the tenacity of the cements are of course additional securities. The part in which the construction is weakest will be near the base, more particularly if the joints become nearly horizontal at the base, or if the circumference at the base be very considerable. This weak point is generally secured in practice by bringing strong chains or hoops round the horizontal courses at the interior of the base. Dr. Robison says, 'The immense addition of strength which may be derived from hooping largely compensates for all defects; and there are hardly any bounds to the extent to which a very thin dome vaulting may be carried when it is hooped or framed in the direction of the horizontal courses.' This system of internal hooping is every way preferable to reliance upon cements, and may, without interference with the ornamental part of the design, be carried to any length. Among other advantages, a dome may be made by means of it to rise vertically from the base, which cannot be the case in an arch.

The thickness of a dome should increase towards the base. A perfectly spherical dome, that is, a segment of a hollow shell cut off by a plane, and therefore of uniform thickness, will stand securely if the arch of the generating circle subtend at the centre less than 51° 49'. The law of the thickness necessary to secure equilibrium is as follows:



Let the dome be formed by the revolution of A V and B W, and let P K, the joint of one of the stones, be always perpendicular to the interior curve; which is usually the case in practice. Let A M = x, M P = y, P K = z, arc B P = s; and let μ be any constant *greater than unity*, and A any constant whatever. Then there will be equilibrium, the equation of B P W being given, if

$$z=\frac{A\rho}{y}\left(\frac{dx}{dy}\right)^{\mu-1}\cdot\frac{ds}{dy}\cdot\frac{ds}{dy}$$

or θ being the angle K G B, and ρ the radius of curvature at P

$$z=\frac{A\rho\,\tan\theta^{\mu-1}}{y\cos^2\theta}$$

For the demonstration of this formula, see Venturoli's *Mechanics* (Cresswell's translation), or Robison's *Mechanical Philosophy*. It is not necessary that μ should be a constant: a reference to the work first cited will shew how to proceed on the supposition that it is a *function of x* greater than unity.

DOME, a term applied to a covering of the whole or part of a building. The Germans call it *Dom*, and the Italians *Duomo*, and apply the term to the principal church of a city, although the building may not have any spherical or polygonal dome. From this and other circumstances we may infer the term to be derived from the Latin *Domus*, house.

The remains of antient domes are generally spherical in their form, and built of stone or tufo.

The word dome is applied to the external part of the spherical or polygonal roof, and cupola to the internal part. Cupola is derived from the Italian *cupo*, deep, whence also our word cup. But cupola and dome are often used synonymously, although perhaps incorrectly.

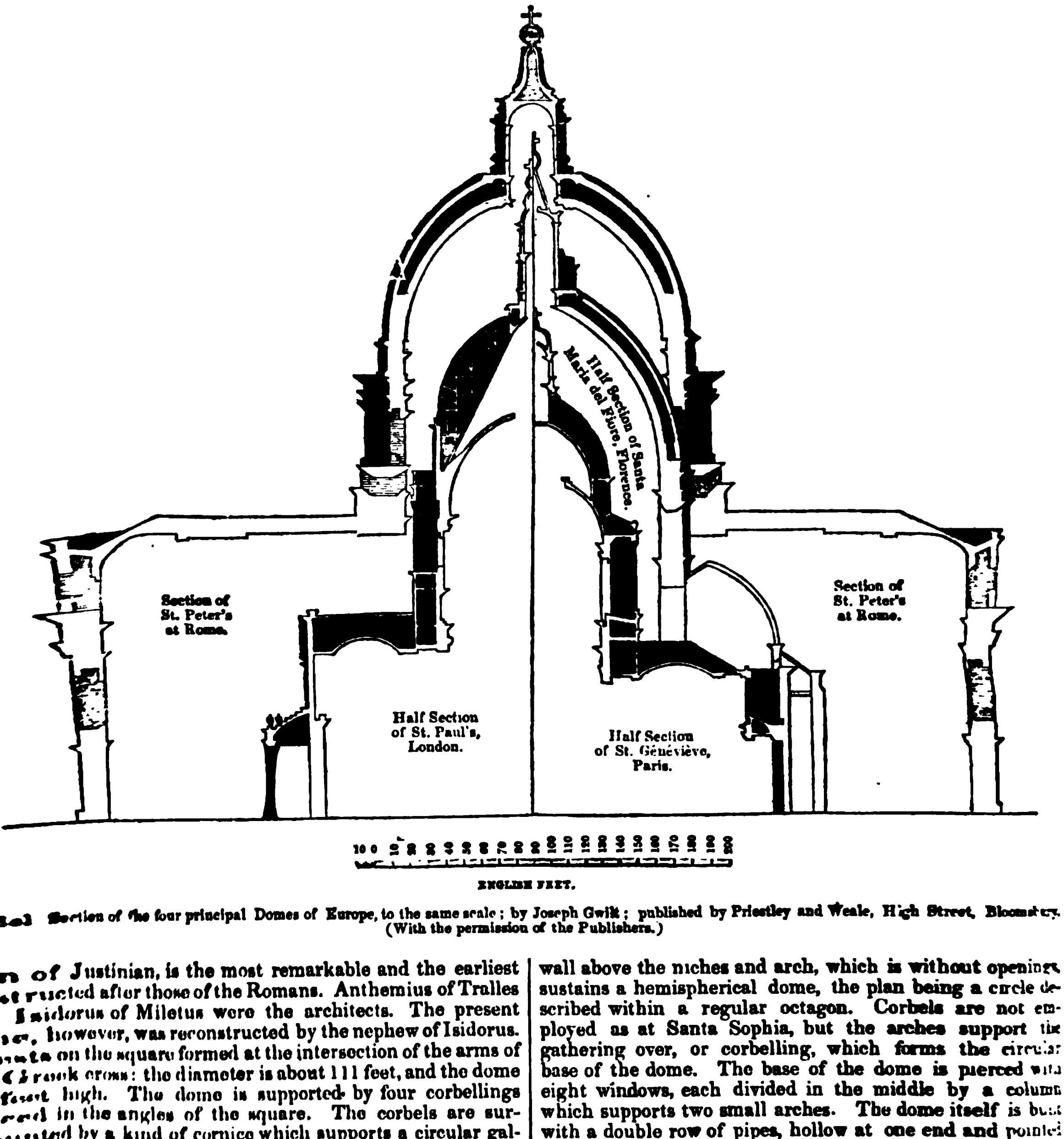
Ruins of numerous domes still exist in the neighbourhood of Rome and Naples. The principal in and near Rome are the Pantheon and the temples of Bacchus, Vesta, Romulus, Hercules, Cybele, Neptune, and Venus, and also some of the Chambers of the Thermæ.

The most magnificent dome of antiquity is that of the Pantheon, supposed to be a chamber of the great baths of Agrippa. The diameter of the dome internally is 142 ft. 9½ in., with a circular opening at the top in the centre 28 ft. 6 in. in diameter. The height of the dome from the top of the attic is 70 ft. 8 in. Internally it is decorated with five rows of square compartments. Each row is considerably larger than that immediately above it, as they converge towards the top. The large squares, all of which are rather more than 12 feet each way, contain four smaller squares sunk one within the other. It is supposed that these squares were decorated with plates of silver, from some fragments of that metal having been found on them. The opening at the top of the dome was decorated with an ornamented bronze moulding, gilt. The external part of the dome appears also to have been decorated with bands of bronze. Constantius II. removed the silver and bronze with which the building was decorated. The base of the dome externally consists of a large plinth with six smaller plinths or steps above it; and in the curve of the dome a flight of steps is formed which leads to the opening at the top of the dome. From the drawings of the architect Serlio it appears that flights of steps were formed at intervals all round the dome, which are now covered with the lead placed there by order of Urban VIII. The dome is constructed of bricks and rubble. Sunk bands round the hollow squares or caissons appear to be formed in brick, and the other parts in tufo and pumice stone. The thickness of the dome of the Pantheon is about 17 ft. at the base, 5 ft. 1½ in. at the top of the highest step, and 4 ft. 7 in. at the top of the dome. The circular wall which supports the dome is 20 ft. thick. This wall is however divided by several large openings, and is furnished with discharging arches of brick. It is most probable that the dome of the Pantheon was executed by means of a centering of wood with the hollow squares formed in relief upon it, as was afterwards done in constructing the great vaulting of St. Peter's.

The dome of one of the chambers of the Thermæ of Caracalla was 111 feet in diameter. In the Thermæ of Titus there are two domes each 54 feet in diameter, and in the baths of Constantine there was one of 75 feet. There were three domes in the baths of Diocletian, of which two still remain; one is 73 feet 6 inches in diameter, and the other 62 feet 3 inches. Judging from those that remain, there is every reason to believe that in the Thermæ they were all lighted from above, like the dome of the Pantheon. Near Pozzuoli there is a very perfect circular building, with a dome 80 feet in diameter, built of volcanic tufo and pumice stone. The temple of Minerva Medica, without the walls of Rome, was on the plan a polygonal dome of ten sides built of brick and pumice stone. This building does not appear to have had any opening at the top.

The antients appear to have constructed domes on corbels. At Catania there is a spherical dome which covers a square vestibule; and in one of the octagonal rooms of the enclosure surrounding the baths of Caracalla the corbels still remain which most probably supported the dome of the chamber.

The dome of Santa Sophia, at Constantinople, built in the


Half Section of Santa Maria del Fiore, Florence.
Section of St. Peter's at Rome.
Half Section of St. Paul's, London.
Half Section of St. Géneviève, Paris.
Section of St. Peter's at Rome.
ENGLISH FEET.

Parallel Section of the four principal Domes of Europe, to the same scale; by Joseph Gwilt; published by Priestley and Weale, High Street, Bloomsbury. (With the permission of the Publishers.)

reign of Justinian, is the most remarkable and the earliest constructed after those of the Romans. Anthemius of Tralles and Isidorus of Miletus were the architects. The present dome, however, was reconstructed by the nephew of Isidorus. It rests on the square formed at the intersection of the arms of the Greek cross: the diameter is about 111 feet, and the dome 40 feet high. The dome is supported by four corbellings placed in the angles of the square. The corbels are surmounted by a kind of cornice which supports a circular gallery. The lower part of the dome is pierced with a row of small windows adorned with columns on the exterior. Externally the dome is divided by projecting ribs, rounded and covered with lead. The top is surmounted by a lantern or finishing like a baluster, on which is a cross. The dome of Anthemius and Isidorus was not so high, and was partly destroyed twenty-one years after its construction by an earthquake during the lifetime of Justinian. In the reconstruction the nephew of Anthemius used very light white bricks, only one fifth the weight of common bricks, which are said to have been made in Rhodes. It appears from the history and description of the building of Santa Sophia, by Procopius, that the architects encountered many difficulties, which arose probably from not being thoroughly acquainted with the principles on which domes should be constructed. (Procopius, περὶ κτισμάτων, lib. i. cap. 1.)

The dome of San Vitale, at Ravenna, which is considered to be more ancient than that of Santa Sophia, is curiously constructed. The lower part of the plan of the dome is a regular octagon, which is supported by eight piers placed at the angles of the dome. Between these angles are seven niches divided into two stories. The lower [illegible] are open and ornamented with columns, the upper is open. The eighth side of the dome is pierced with a great arch formed by an entrance. The arch is of the diameter and the same height as the niches. The wall above the niches and arch, which is without openings, sustains a hemispherical dome, the plan being a circle described within a regular octagon. Corbels are not employed as at Santa Sophia, but the arches support the gathering over, or corbelling, which forms the circular base of the dome. The base of the dome is pierced with eight windows, each divided in the middle by a column which supports two small arches. The dome itself is built with a double row of pipes, hollow at one end and pointed at the other, the point of one being placed in the hollow of the preceding. They are thus continued in a gentle spiral line until they finish at the top. Between the top of the small arched windows and the pipes there is a construction formed with vases, not unlike the system adopted in the circus of Caracalla. [CIRCUS, vol. vii., p. 197.] The dome itself is covered with mortar both within and without.

The church of San Marco at Venice, built in the tenth century, by order of Pietro Orseolo, the then doge, is decorated with five domes. One of these, placed in the centre of the church, is much larger than the others. Each dome is enclosed within four pieces of semi-cylindrical vaulting, together forming a square, in the angles of which are four corbels, which gather in the circular base of each dome. The lower part of the dome is pierced with small windows. The interior is covered with mosaic, and the top of the dome is terminated with a finishing on which is a cross. In 1523 the doge, Andrea Gritti, caused the domes to be repaired, and Sansovinus, the architect, restored in a great measure the supports, and placed (at about one third of its height) a great circle of iron round the large dome to prevent its falling; a precaution which has been completely successful. The other domes are not so well preserved. In 1729 one of the smaller domes was in danger of falling, from the decay which had taken place in a circular bond placed at the base of the dome. Stone was however substituted for the wooden bond, and a circle of iron placed without the dome near its base. In 1735 Andrew Tirali, the architect to the church, placed an iron circle round the dome which is near the great gate, on account of some small fractures which were then perceived. If, however, the other domes are constructed with a wooden bond, it is very probable that they will eventually fall unless steps be taken in time to remove the timber. By the use however of corrosive sublimate, now used in Kyan's patent for preserving wood from the dry rot, wood may be used in the construction of domes with much more security as regards durability.

The celebrated dome of Santa Maria del Fiore, built by Brunelleschi, is far superior in construction to the domes of Santa Sophia and San Marco. Brunelleschi first constructed the octagon tower which supports the dome. Each face of the tower is pierced with a circular window; the walls are 17 feet thick, and the cornice which terminates the tower is 173 feet from the ground. From this cornice rises the double dome.

The external dome is 7 ft. 10 in. thick at the base. The internal dome, which is connected at the angles with the external dome, is 139 ft. in diameter and 133 ft. high from the top of the internal cornice of the tower to the eye of the lantern. This dome has eight angles, forming a species of Gothic vault, and was the first double dome with which we are acquainted. Some time after the dome was finished, several fractures were perceived in it, which were owing to settlements in the masonry; but the fractures were filled up, and no new signs of settlement have showed themselves since.

The first modern dome constructed in Rome was that of the Church of Our Lady of Loretto. It was commenced in 1507 by Antonio Sangallo. The dome, which is double, is circular on the plan. The internal dome is constructed on double consoles, instead of corbellings. The double consoles are crowned with a small cornice, forming an impost for eight arches, from the upper part of which springs the dome. On the top is a lantern light, which is not apparent externally. Up to this time domes had been constructed on walls and corbellings; but in St. Peter's at Rome a new plan was adopted. The dome of St. Peter's stands upon four piers, 61 ft. 11 in. high, and 30 ft. 10 in. thick, measured in a straight line with the arches. From the arches spring the corbellings, which are finished by an entablature. Upon this entablature is a plinth. The plinth is externally an octagon, and internally a circle. The external diameter of the octagon is 192 ft. 9 in., and the internal circle 134 ft. 8¼ in.; the thinnest part of the wall, between the octagon and the circle, is 29 ft. 3 in. On the plinth is a circular stylobate, 28 ft. 6¾ in. thick. This thickness is divided into three parts by a circular passage, 5 ft. 10 in. wide; the two walls on each side of this passage are, respectively, the internal wall 14 ft. 7½ in. thick, and the external 6 ft. In the internal wall are other smaller passages, 2 ft. 10 in. wide, forming flights of steps communicating with the four spiral staircases formed in the thickness of the wall of the drum of the dome. Above the circular stylobate, which is 12 ft. 4¼ in. high, is placed the drum of the dome, which is 10 ft. 1¼ in. thick, measured to the inside line of the pilasters, which decorate the interior of the dome. The pilasters themselves are 1·78 ft. thick in addition. The construction is formed of rubble and fragments of brick. The interior is lined with bricks stuccoed. Externally the work is faced with thin slabs of travertine stone. The drum is pierced with 16 windows, 9 ft. 3¾ in. wide and 17 ft. high. The walls are strengthened on the outside, between the windows, with 16 buttresses, constructed with solid masonry. These buttresses are 13 ft. 3 in. wide and 51 ft. 6 in. in height from the base to the top of the entablature. Each buttress is decorated and strengthened with half pilasters, and terminates with two coupled columns engaged, the diameter of which is 4 ft.; the order is Corinthian. When the base of the dome had been built to the height of the entablature of the drum, Michel Angelo died; but some time before his death he had caused a wooden model to be made, with ample details, to which he added drawings and instructions. After his death Pirro Ligorio and Vignola were appointed the architects. Giacomo della Porta, the pupil of Vignola, followed his master as architect to the cathedral; but though the designs of Michel Angelo were strictly followed, the dome itself was constructed under the pontificate of Sixtus V. Sixtus gave Giacomo della Porta as a colleague Domenico Fontana, by whom the dome was constructed.

On the constructions of Michel Angelo a circular attic was first formed, 19 ft. 2½ in. high and 9 ft. 7 in. thick. This attic is strengthened externally by 16 projections, 2 ft. 11 in. deep and 6 ft. 8½ in. wide, placed over the buttresses of the drum. On the attic rises the double dome, the internal diameter of which, at the base, is 138 ft. 4 in. The curve externally is an arc of a circle whose radius is 89 ft. 1·83 in. To the height of 47 ft. 8 in. from the attic the dome is solid. At the base the thickness is 9 ft. 7 in.; and as the external dome is raised higher than the internal dome, the thickness is increased as the curve ascends, so that where the dome is divided the thickness is 11 ft. 4 in. The circular space which divides the two domes is 3 ft. 2½ in. wide; the internal dome is 6 ft. 4 in. thick; and the height from the attic to the opening of the lantern is 93 ft. 10 in. The diameter of the lantern is 24 ft. 10 in. The external dome is 3 ft. 10½ in. thick where it separates itself from the internal dome; and it is strengthened externally by 16 projecting bands of the same thickness. The dome is pierced with three rows of small windows. As the curves of the dome are not concentric, the space between them becomes wider as it rises; so that at the opening of the lantern the space is 10 feet wide. These domes are joined together by 16 walls or spurs, diminishing in thickness as they ascend to the lantern; at the base they are 9 ft. thick, and at the summit 3 ft. The base of the lantern is arched, and pierced with small windows. Above the two domes is a circular platform, surrounded with an iron gallery. In the centre rises the lantern, on a stylobate broken into 16 parts, forming projecting pedestals, above which are buttresses similar to the buttresses of the drum, decorated externally with coupled Ionic columns, 17½ in. in diameter. The space between the buttresses is filled with arched openings, which give light to the lantern. The external diameter of the lantern is 39 ft.; the internal diameter 25 ft. 10¾ in.; and the height from the platform to the top of the cross is 89 ft. 7¾ in. The whole height, from the external plinth of the dome to the cross, is 263 ft. The total height from the pavement is 437 ft. 5 in. The total height internally, to the top of the dome of the lantern, is 387 ft.

Sixtus V. covered the external dome with lead, and the bands with bronze gilt. One hundred thousand large pieces of wood were used in making the centering of the domes, which was so admirably constructed, that it appeared suspended in the air. (See the drawings in the work by Fontana, on the construction of this dome.) This centering was more for the purpose of a scaffolding for the materials and workmen, than to sustain the weight of the double dome. During the construction of the dome it is believed that only two circles of iron were placed round the masonry, one of which was placed on the outside of the internal dome, at about 30 feet from its springing, and one foot above the division of the domes. The bands of iron of which this circle is composed are 3 in. wide by 1¾ in. thick. A similar circle is placed about the middle of the solid part of the dome, at about 17 feet 6 inches above the springing of the internal dome. Near the top of the internal dome there are several holes, at the bottom of which upright iron bars appear. These bars are said to be the connecting rods which keep together other circles of iron placed at different heights within the masonry, which are finally terminated by a circle round the eye of the dome.

The domes were constructed with such haste, that sufficient time was not allowed to the work to form solid beds as it was carried up, in consequence of which a great number of vertical settlements took place, and the circle of iron round the internal dome was fractured. To obviate the danger arising from these settlements, six circles of iron were placed round the external dome at different heights, and the broken circle of the internal dome was repaired. The first circle was placed above the cornice of the external stylobate, or continuous plinth, on which the buttresses stand; the second circle was placed above the cornice of the buttresses, the third above the attic at the springing of the external dome, the fourth half way up the external dome, and the fifth under the base of the lantern. A sixth was shortly after placed at one foot below where the dome divides itself. The iron bands are flat, from 16 to 17 feet long, 3¼ inches wide, and 2⅝ in. thick. At one end of the pieces of iron a hole is made; the other end is turned up and passed through the eye of the next band. The whole of these bands are fixed with iron wedges, driven into the rubble with mallets. Sheets of lead are placed under the iron circles. In the 'Encyclopédie Méthodique' there is a detailed account of the various fractures of the dome, and the means employed to repair them. ('Coupole,' *Encyclopédie Méthodique*, 'Architecture.')

The dome of St. Paul's cathedral, London, is placed over the intersection of the four naves. The ground plan is a regular octagon, each face of which is 44 feet 8¾ inches wide: four of these sides are formed by the four great arches of the naves; the other four sides are formed by false arches of the same size; in each of these arches there is a great niche, the base of which is pierced with two arches. By this means eight supports are obtained instead of four, and the corbellings do not project too much, as in other similar constructions. The corbellings gather in a circle, the diameter of which is 104 feet 4 inches, the octagon base being 107 feet. The corbellings are surmounted by a complete entablature 8 feet 3 inches high, decorated with consoles. The drum is set back 3 feet 2½ inches from the face of the frieze, and this intermediate space is occupied by two steps and a seat. The cornice is 98 feet 9¼ inches from the pavement. The height of the drum from the top of the seat is 62 feet 6¼ inches to the springing of the internal dome. The wall forming the drum is inclined internally 4 feet 11½ inches, or about the 12th part of its height. This was designed by the architect to increase the resistance of the walls to the united pressure of the large internal vault and the conical dome which carries the lantern.

The interior of the drum is decorated with a continuous stylobate, on which is an order of Corinthian pilasters. The 32 spaces between the pilasters are filled with 24 windows and eight large niches. Externally the drum is decorated with an order of 32 Corinthian columns engaged, which are united to the wall of the drum by eight solid constructions in masonry. In each space between the constructions there are three intercolumnations, the columns being joined at their bases by walls pierced with arches. The external colonnade is surmounted by an entablature, with a mutuled cornice, on which is a balustrade; behind this is a terrace, formed by the recessing back. The attic is 22 feet 4½ inches high from the top of the balustrade to the under side of the cornice of the attic. Above the internal order of the drum rises the interior dome, the diameter of which at the springing is 102 feet 2¾ inches by 51 feet in height. The top of the dome has a circular opening 14 feet 10¾ inches in diameter.

Above the attic are two steps, from which the external dome springs. The external dome is constructed of wood, covered with lead, and decorated with projecting ribs forming pannels, curved at the ends. This dome terminates with a finishing which joins the base of the lantern: the circular gallery formed on the finishing is 274 feet 9 inches above the pavement of the nave. The lantern is supported on a conical tower, terminated by a spherical dome. This tower, which is joined to the internal dome at its base, disengages itself from it at the height of 8 feet 6 inches above the springing of the same. The perpendicular height of this tower is 86 feet 9 inches, and the walls are inclined 24 degrees from the perpendicular: the diameter of the base is 100 feet 1 inch measured externally, and 34 feet 1 inch at the springing of the spherical dome which finishes it. The wall of this tower is built of brick, and is 1 foot 7 inches thick, with circular rings of masonry, fastened with iron bands. The spherical dome at the top of the tower has an opening 8 feet in diameter at the summit. Between the attic and the wall of the tower are 32 walls or buttresses, which also serve to bear the ribs of the wooden external dome.

About the same time that Wren built the dome of St. Paul's, Hardouin Mansard, a French architect, constructed the dome of the Invalides at Paris. The plan of this dome is a square, in which is inscribed a Greek cross; in the angles of the square there are four chapels. The dome is raised in the centre of the Greek cross; the base supporting it is an octagonal figure, with four large and four small sides. The four small sides form the faces of the piers of the dome; the large sides are the arched openings of the nave and transverse aisles. A circular entablature is placed over the corbellings, and on the entablature is raised the drum of the dome, the diameter of which is 79 feet 9½ inches. terior of the drum is decorated with a continuous stylobate, above which are coupled pilasters of the composite order, and the wall is pierced with 12 windows. The dome, which is double, rises from a springing common to both. The lower or internal dome, constructed with masonry, is spherical, and is 83 feet in diameter, with an opening or eye at the top 53 feet 3 inches in diameter, through which part of the outer dome can be seen. The outer dome is of a spheroidal form, and constructed of stone at the base and of brick above. Externally the dome is formed with a stylobate, on which is a Corinthian order of columns, over which is an attic with pilasters, and buttresses in the form of consoles. The drum is fortified externally by eight projections, placed two and two above each pier of the dome. The external dome is framed of wood, and covered with lead, like St. Paul's, London, but the construction is much heavier. The external diameter of the dome is 85 feet [illegible] inches, and its height is 57 feet 2½ inches. The finishing of the dome is decorated with consoles, on which is formed a circular balcony round the base of the lantern, constructed of wood, which is 39 feet 4¾ inches high; the lantern above it, with the cross, is 35 feet 4¾ inches high. The total height from the ground is 330 feet.

The dome of the Pantheon at Paris is constructed entirely of stone, and is placed in the centre of a Greek cross. It is supported by four triangular piers strengthened by engaged columns of the Corinthian order. The four piers with the lines of the intermediate arches form externally a large square, each side of which is 74 feet 9 inches.

These four piers are pierced above with arched openings, and between the piers with the openings are large arches, the diameter of which is 44 feet 11½ inches, and the height 85 feet 5 inches. Between these arches rise the corbellings, which are gathered in to form the circular plan of the drum. The arches and the corbellings are crowned with a large entablature 13 feet 4 inches high. The upper part of the cornice of the entablature is raised 101 feet above the pavement of the nave. The diameter taken at the frieze is 84 feet. The internal drum which is constructed on this entablature is 55 feet 7½ inches in height to the springing of the internal dome. The interior of this drum is decorated with a continuous stylobate, which is the basement of a colonnade of 16 Corinthian columns almost isolated from the wall. These columns are 35 feet 2¾ inches in height. Between the columns are 16 windows; four of which are false, are placed above the four piers of the dome. The colonnade is crowned with an entablature, above which is a large plinth which rises to the springing of the internal dome. The internal dome is 66 feet 8¼ inches in diameter at the springing, and is decorated with octagonal caissons or sinkings with a rose in the centre of each. The eye at the top of the dome is 31 feet 3¼ inches in diameter. Through this eye is seen the upper part of another or intermediate dome. The external dome is placed on a circular base 108 feet 7½ inches in diameter and square at the bottom. The angles are strengthened by flying buttresses. Above the corbellings a circular wall is constructed, forming an external continuous stylobate which supports an external colonnade. The external colonnade constructed on the stylobate forms a peristyle round the dome, and is composed of 32 isolated columns of the Corinthian order 36 feet 5¾ inches high. This colonnade is divided into four parts by the solid constructions in masonry raised over the four piers. The external colonnade is surmounted with an entablature and balustrade above it. There is an attic constructed above the circular wall of the drum, set back 1[illegible] feet 10 inches, and pierced with 16 windows, twelve of which light the space between the internal dome and the intermediate dome which bears the lantern. This attic is terminated with a cornice with a step or plinth above. The external dome 77 feet 8¾ in diameter, measured on the outside, is constructed with masonry; the height is 45 feet 9½ inches from the top of the attic to the underside of the finishing against which the curve terminates. The outside of the dome is covered with lead, and is equally divided vertically by 16 projecting ribs. The intermediate dome, built for the purpose of carrying the lantern, was intended to be decorated with subjects by the painter, and we believe it has since been decorated. The form of this dome resembles the small end of an egg: its springing commences at the base of the attic at the point where the internal dome begins to disengage itself. This dome is 50 feet ¾ inch high, and 70 feet 3½ inches in diameter, and is pierced with four great openings at the lower part 37 feet 3 inches high.

and 30 feet 10½ inches wide at the base. On a circular platform above the summit of the dome are eight piers with arches, which support the finishing against which the external dome terminates. Above this is the lantern of the dome.

Very full details of the most remarkable domes in Europe are given in the 'Encylopédie Méthodique' *(Architecture)*, from which this brief notice is in a great measure taken. For an account of the construction of wooden-ribbed domes, see Nicholson's Architectural Dictionary; also the section of the Pantheon dome by Taylor and Cressy; and the work on St. Peter's, by Fontana.

The following admeasurements of most of the principal domes of Europe are from Mr. Ware's 'Tracts on Vaults and Bridges.'

	Feet in diameter, taken externally.	High from the ground line.
Domes of Antiquity.		
Dome of the Pantheon	142	143
„ Minerva Medica at Rome	78	97
„ Baths of Caracalla	112	116
„ Baths of Diocletian	74	83
Temple of Mercury	68	
„ Diana	98	78
„ Apollo	120	
„ Proserpine and Venus	87	77
Domes of comparatively modern Times.		
Santa Sophia at Constantinople	115	201
Mosque of Achmet, ditto	92	120
San. Vitale at Ravenna	55	91
San Marco at Venice	44	
From the time of Brunelleschi to the present period.		
Santa Maria del Fiore at Florence	139	310
The Chapel of the Medici	91	199
Baptistry at Florence	86	110
Cathedral of St. Peter at Rome	139	330
Ch. of the Madonna della Salute at Venice	70	133
„ Superga at Turin	64	128
„ Invalides at Paris	80	173
„ Val de Grace, Paris	55	133
„ Sorbonne, Paris	40	110
Pantheon, or St. Géniève, Paris	67	190
Cathedral of St. Paul's, London	112	215

DOMENICHI'NO, DOMENI'CO ZAMPIERI, called **DOMENICHINO**, was born at Bologna, in 1581, of poor parents. According to some authorities, his first master was Denis Calvart; but Bellori gives him Fiammingo for his first teacher. The latter, entertaining a jealous dislike (says the biographer) to the Caracci, beat his pupil, and turned him out of doors, because he found the boy copying a design by Annibale. On the occasion of his dismissal being made known to Agostino Caracci, he was admitted to the study of the Caracci, and he soon gained one of the prizes which Lodovico customarily distributed, to the surprise of his fellow-students, who had expected little from a youth of his bashful, retiring, awkward manners. After visiting Parma, Domenichino went to Rome, where he studied and worked for some time under Annibale Caracci. He afterwards obtained the patronage of Cardinal Gieronimo Agucchi, and while he lived in his house painted many pictures for him. Besides painting, he studied architecture, and was appointed architect to the apostolic palace by Gregory XV. After the death of that pontiff, finding himself somewhat reduced in circumstances, and receiving an invitation to Naples, he removed thither with his wife and children. He died in 1641. During his life he was much respected. He formed a particularly strict friendship with Albano, in whose house he lived for two years when he first arrived in Rome.

Domenichino was so slow in his early progress as to disappoint many of his friends, and he had the appellation of Bue (ox) among his fellow-students; but Annibale Caracci, who perceived in him the marks of that genius which he afterwards developed, told the jeerers that their nickname was only applicable to the patience and fruitful industry of the laborious student. He retained the utmost deliberation in his mode of working to the last; and it was his custom, if he had anything to design, not to proceed at once to work with his pencil, but to reflect some time upon his subject; when, however, he once took it in hand, slow as he was, he did not leave it until he had completed it. It is said that he had many maxims which justified his slowness: such as, that no line was worthy of an artist which was not in his mind before it was traced by his hand. He entered so fully into his subject, that he was once surprised acting the scene which he had to paint, in person, by Annibale Caracci, who burst into raptures at so instructive a lesson. Annibale ever sympathized with enthusiasm and activity of will in painting. Domenichino only left his retired study to make sketches and observations upon expression in active life, and spent much of his time in reading history and poetry.

Domenichino was profoundly studied in his drawing, rich and natural in his colouring, and, above all, correct and lifesome in his expression. Annibale is said to have been decided in his judgment between two pictures of the Scourging of St. Andrew, painted in competition by Domenichino and Agostino Caracci, by hearing an old woman point out with much earnestness the beauties of Domenichino's to a little child, describing every part as if it were a living scene, while she passed the other over in silence. To the graver design of the Bolognese school Domenichino added something of the ornamental manner of the Venetian, his pictures being rich in the accessaries of architecture and costume. His genius, however, is not characterized by great invention, and he has been accused of borrowing too directly from the works of others; and his draperies have been confessed by his admirers to be harsh and too scanty in the folds. Nevertheless, he has been esteemed by the best judges (and among them are the Caracci and Nicholas Poussin) as one of the first of painters, and by some second only to Raphael. Such, however, he will never be thought by the world at large.

Domenichino excelled also in landscape, and was famous for his admirable execution of the figures with which he enlivened them. His principal works are at Rome and Naples; among them the Communion of St. Jerome and the Martyrdom of St. Agnes are the most celebrated. (Bellori.)

DOMESDAY BOOK, the register of the lands of England, framed by order of King William the Conqueror. It was sometimes termed *Rotulus Wintoniæ*, and was the book from which judgment was to be given upon the value, tenures, and services of the lands therein described. The original is comprised in two volumes, one a large folio, the other a quarto. The first begins with Kent, and ends with Lincolnshire; is written on three hundred and eighty-two double pages of vellum, in one and the same hand, in a small but plain character, each page having a double column; it contains thirty-one counties. After Lincolnshire (fol. 373), the claims arising in the three ridings in Yorkshire are taken notice of, and settled; then follow the claims in Lincolnshire, and the determinations of the Jury upon them (fol. 375); lastly, from fol. 379 to the end there is a recapitulation of every wapentake or hundred in the three ridings of Yorkshire; of the towns in each hundred, what number of carucates and ox-gangs are in every town, and the names of the owners placed in a very small character above them. The second volume, in quarto, is written upon four hundred and fifty double pages of vellum, but in a single column, and in a large fair character, and contains the counties of Essex, Norfolk, and Suffolk. In these counties the 'liberi homines' are ranked separate; and there is also a title of 'Invasiones super Regem.'

These two volumes are preserved, among other records of the Exchequer, in the Chapter House at Westminster: and, at the end of the second, is the following memorial in capital letters of the time of its completion: 'Anno Millesimo Octogesimo Sexto ab Incarnatione Domini, vigesimo vero regni Willielmi, facta est ista Descriptio, non solum per hos tres Comitatus, sed etiam per alios.' From internal evidence there can be no doubt but that the same year, 1086, is assignable as the date of the first volume.

In 1767, in consequence of an address of the House of Lords, George III. gave directions for the publication of this Survey. It was not, however, till after 1770 that the work was actually commenced. Its publication was entrusted to Mr. Abraham Farley, a gentleman of learning as well as of great experience in records, who had almost daily recourse to the book for more than forty years. It was completed early in 1783, having been ten years in passing through the press, and thus became generally accessible to the antiquary and topographer. It was printed in fac-simile, as far as regular types, assisted by the representation of particular contractions, could imitate the original.

In 1816 the commissioners upon the Public Records published two volumes supplementary to Domesday, which now form one set with the volumes of the Record: one of these contains a general introduction, accompanied with two different indexes of the names of places, an alphabetical index of the tenants in capite, and an 'Index Rerum.' The other contains four records; three of them, namely, the Exon Domesday, the Inquisitio Eliensis, and the Liber Winton., contemporary with the Survey: the other record, called 'Boldon Book,' is the Survey of Durham, made in 1183, by bishop Hugh Pudsey. These supplementary volumes were published under the superintendence of Sir Henry Ellis.

Northumberland, Cumberland, Westmorland, and Durham were not included in the counties described in the Great Domesday; nor does Lancashire appear under its proper name; but Furness, and the northern part of that county, as well as the south of Westmorland and part of Cumberland are included within the West Riding of Yorkshire: that part of Lancashire which lies between the rivers Ribble and Mersey, and which at the time of the Survey comprehended six hundreds and 188 manors, is subjoined to Cheshire. Part of Rutlandshire is described in the counties of Northampton and Lincoln; and the two antient hundreds of Atiscross and Existan, deemed a part of Cheshire in the Survey, have been since transferred to the counties of Flint and Denbigh. In the account of Gloucestershire we find a considerable portion of Monmouthshire included, seemingly all between the rivers Wye and Usk. Kelham thinks it probable that the king's commissioners might find it impossible to take any exact survey of the three counties northernmost of all, as they had suffered so much from the Conqueror's vengeance. As to Durham, he adds, all the country between the Tees and Tyne had been conferred by Alfred on the bishop of this see; and at the coming in of the Conqueror he was reputed a count-palatine.

The order generally observed in writing the Survey was to set down in the first place at the head of every county (except Chester and Rutland) the king's name, *Rex Willielmus*, and then a list of the bishops, religious houses, churches, any great men, according to their rank, who held of the king in capite in that county, likewise of his thains, ministers, and servants; with a numerical figure in red ink before them, for the better finding them in the book. In some counties the cities and capital boroughs are taken notice of before the list of the great tenants is entered, with the particular laws or customs which prevailed in each of them; and in others they are inserted promiscuously. After the list of the tenants, the manors and possessions themselves which belong to the king, and also to each owner throughout the whole county, whether they lie in the same or different hundreds, are collected together and minutely noted, with their under-tenants. The king's demesnes, under the title of *Terra Regis*, always stand first.

For the adjustment of this Survey certain commissioners, called the king's justiciaries, were appointed. In folios 164 and 181 of the first volume we find them designated as 'Legati Regis.' Those, for the midland counties at least, if not for all the districts, were Remigius, bishop of Lincoln, Walter Giffard, earl of Buckingham, Henry de Ferrers, and Adam, the brother of Eudo Dapifer, who probably associated with them some principal person in each shire. These inquisitors, upon the oaths of the sheriffs, the lords of each manor, the presbyters of every church, the reves of every hundred, the bailiffs and six villains of every village, were to enquire into the name of the place, who held it in the time of king Edward, who was the present possessor, how many hides in the manor, how many carucates in demesne, how many homagers, how many villains, how many cotarii, how many servi, what free-men, how many tenants in socage, what quantity of wood, how much meadow and pasture, what mills and fish-ponds, how much added or taken away, what the gross value in king Edward's time, what the present value, and how much each free-man, or soc-man had or has. All this was to be triply estimated: first, as the estate was held in the time of the Confessor; then as it was bestowed by king William; and thirdly, as its value stood at the formation of the Survey. The jurors were, moreover, to state whether any advance could be made in the value. Such are the exact terms of one of the inquisitions for the formation of this Survey, still preserved in a register of the monastery of Ely.

The writer of that part of the Saxon Chronicle which relates to the Conqueror's time, informs us with some degree of asperity, that not a hide or yardland, not an ox, cow, or hog, was omitted in the census. It should seem, however, that the jurors, in numerous instances, framed returns of a more extensive nature than were absolutely required by the king's precept, and it is perhaps on this account that we have different kinds of descriptions in different counties.

From the space to which we are necessarily limited, it is impossible to go more minutely into the contents of this extraordinary record, to enlarge upon the classes of tenantry enumerated in it, the descriptions of land and other property therewith connected, the computations of money, the territorial jurisdictions and franchises, the tenures and services, the criminal and civil jurisdictions, the ecclesiastical matters, the historical and other particular events alluded to, or the illustrations of antient manners, with information relating to all of which it abounds, exclusive of its particular and more immediate interest in the localities of the country for the county historian.

As an abstract of population it fails. The tenants in capite, including ecclesiastical corporations, amounted scarcely to 1400; the under-tenants to somewhat less than 8000. The total population, as far as it is given in the record itself, amounts to no more than 282,242 persons. In Middlesex, pannage (payment for feeding) is returned for 16,535, in Hertfordshire for 30,705, and in Essex for 92,991 hogs; yet not a single swine-herd (a character so well known in the Saxon times) is entered in these counties. In the Norman period, as can be proved from records, the whole of Essex was, in a manner, one continued forest; yet once only in that county is a forester mentioned, in the entry concerning Writtle. Salt-works, works for the production of lead and iron, mills, vineyards, fisheries, trade, and the manual arts, must have given occupation to thousands who are unrecorded in the survey; to say nothing of those who tended the flocks and herds, the returns of which so greatly enlarge the pages of the second volume. In some counties we have no mention of a single priest, even where churches are found; and scarcely any inmate of a monastery is recorded beyond the abbot or abbess, who stands as a tenant in capite. These remarks might be extended, but they are sufficient for their purpose. They show that, in this point of view, the Domesday Survey is but a partial register. It was not intended to be a record of population further than was required for ascertaining the geld.

There is one important fact, however, to be gathered from its entries. It shows in detail how long a time elapsed before England recovered from the violence attendant on the Norman Conquest. The annual value of property, it will be found, was much lessened as compared with the produce of estates in the time of Edward the Confessor. In general, at the Survey, the king's lands were more highly rated than before the Conquest; and his rent from the burghs was greatly increased; a few also of the larger tenants in capite had improved their estates: but, on the whole, the rental of the kingdom was reduced, and twenty years after the Conquest the estates were, on an average, valued at little more than three fourths of the former estimate. An instance appears in the county of Middlesex, where no Terra Regis however occurs. The first column, headed T. R. E., shows the value of the estates in the time of king Edward the Confessor; the second, the sums at which they were rated at the time of the Survey, *tempore Regis Willielmi*:—

	T. R. E.			T. R. W.		
	£	s.	d.	£	s.	d.
Terra Archiep. Cant.	100	14	0	86	12	0
Terra Episc. Lond. .	190	11	10	157	19	6
Eccl. S. Pet. West. .	114	0	0	86	16	6
Eccl. Trin. Rouen .	25	10	0	20	10	0
Geoff. de Mandeville	121	13	0	112	5	0
Ernald de Hesding .	56	0	0	24	0	0
Walter de St. Waleri	120	0	0	111	0	0
Terr. alior. Tenent .	204	0	0	147	8	0
	932	8	10	746	11	0

We shall now say a few words on the uses and consequences of the Survey. By its completion the king acquired an exact knowledge of the possessions of the crown. It afforded him the names of the landholders. It furnished him with the means of ascertaining the military strength of the country; and it pointed out the possibility of increasing the revenue in some cases, and of lessening the demands of the tax-collectors in others. It was moreover a register of appeal for those whose titles to their property might be disputed.

Appeals to the decision of the Survey occur at a very early period. Peter of Blois notices an appeal of the monks of Croyland to it in the reign of Henry I. Others occur in the *Abbreviatio Placitorum* from the time of John downward. In later reigns the pleadings upon antient demesne are extremely numerous; and the proof of antient demesne still rests with the Domesday Survey. Other cases in which its evidence is yet appealed to in our courts of law, are in proving the antiquity of mills, and in setting up prescriptions *in non decimando*. By stat. 9 Edw. II., called Articuli Cleri, it was determined that prohibition should not lie upon demand of tithe for a *new* mill. The mill, therefore, which is found in Domesday must be presumed older than the 9th Edw. II., and is, of course, discharged, by its evidence, from tithe.

On the discharge of abbey-lands from tithes, as proved by Domesday, it may be proper to state that pope Paschal II. at an early period, exempted generally all the religious from paying tithes of lands in their own hands. The privilege was afterwards restrained to the four favoured Orders, the Cistercians, the Templars, the Hospitallers, and the Premonstratensians. So it continued till the fourth Council of Lateran in 1215, when the privilege was again restrained to such lands as the abbeys had at that time, and was declared not to extend to any after-purchased lands. And it extends only to lands *quæ propriis manibus coluntur*. From the paucity of *dates* in early documents, the Domesday Survey is very frequently the only evidence which can be adduced that the lands claiming a discharge were vested in the monastery previous to the year expressed in the Lateran Council.

Although in early times, Domesday, precious as it was always deemed, occasionally travelled, like other records, to distant parts, till 1696 it was usually kept with the king's seal, at Westminster, by the side of the Tally Court in the exchequer, under three locks and keys, in the charge of the auditor, the chamberlains, and deputy chamberlains of the exchequer. In the last-mentioned year it was deposited among other valuable records in the Chapter House, where it still remains.

The two most important works for the student of the Domesday Survey are Kelham's *Domesday Book illustrated*, 8vo., Lond., 1788, and the *General Introduction* to the survey, reprinted by command of His Majesty under the direction of the commissioners on the Public Records, 2 vols., 8vo., 1833, accompanied by fresh indices. A translation of the whole, under the title of 'Dom-Boc,' was undertaken early in the present century by the Rev. William Bawdwen, vicar of Hooton Pagnell, in Yorkshire, who published Yorkshire with the counties of Derby, Nottingham, Rutland, and Lincoln, in 4to., Doncaster, 1809, followed by the counties of Middlesex, Hertford, Buckingham, Oxford, and Gloucester, 4to., Doncaster, 1812; but the work went no further. County portions of this record will be found translated in most of our provincial histories; the best are undoubtedly those in Dugdale's Warwickshire, Nichols's Leicestershire, Hutchins's Dorsetshire, Nash's Worcestershire, Bray and Manning's Survey, and Clutterbuck's Hertfordshire. Mr. Henry Penruddocke Wyndham published Wiltshire, extracted from Domesday Book, 8vo. Salisb., 1788, and the Rev. Richard Warner, Hampshire, 4to. Lond., 1789. Warwickshire has been published recently by Mr. Reader. There are numerous other publications incidentally illustrative of Domesday topography, which the reader must seek for according to the county as to which he may desire information.

DOMINANT, in music, the fifth of the key. Thus, if the key be *c*, the dominant is *g*.

DOMINGO, ST. [Hispaniola.]

DOMINICA, one of the Antilles, belonging to the English, and lying between the French islands of Martinique and Guadaloupe; the parallel of 15° 18′ N. lat. and the meridian of 61° 25′ W. long. pass through the island. Dominica was discovered by Columbus in 1493, and received its name in consequence of its being first seen on a Sunday. The right of occupancy was long claimed equally by England, Spain, and France, without any active measures being taken on the part of any of those powers for its exclusive possession; so that it became virtually a kind of neutral ground until the year 1759, when its possession was assumed by the English, and their right to hold it was formally recognized, in 1763, by the treaty of Paris. On this occasion commissioners were sent out by the English government, who sold the unsettled lands by auction to the highest bidders. In this way nearly half the island was disposed of in small lots, at prices amounting on the average to 62s. per acre. The occupiers of lands already settled were confirmed in their possession by leases granted for forty years, and renewable, at the annual rent of 2s. per acre. In 1778 Dominica was taken by a French squadron under the Marquis de Bouillé, but was restored to England at the peace in 1783. In 1805 the island was again attacked by the French fleet under Admiral Villeneuve, but was successfully defended by the garrison under Sir George Prevost.

Dominica is 28 miles long and 16 miles broad in the broadest part; but its mean breadth is not more than 9 miles. No regular survey has ever been made; but the area is computed at 260 square miles. The origin of the island is volcanic. Pumice-stone, sulphur, and other volcanic productions are found. An attempt was recently made to trade in sulphur with the United States, but the speculation proved unsuccessful. There are numerous quarries of a volcanic lava, sufficiently durable for the purpose of ordinary buildings, which are worked for the use of the colony. The surface of the island is rugged, and its mountains are among the highest in the Antilles. Morne Diablotin is 5300 feet above the sea. The valleys are very fertile, and watered by numerous streams, of which there are thirty in different parts. About the centre of the island, and about six miles from the town of Roseau, on the top of a high mountain, is a fresh-water lake, with an area of several acres, and in some parts unfathomable. The soil in the valleys having been washed down from the hills by the periodical rains and mixed with decayed vegetable matter, has formed a light brown-coloured mould, which is highly productive; towards the coast the soil is a fine deep black mould on a subsoil of yellow brick clay. The island contains an abundance of large timber-trees of the kinds commonly found in the West India Islands; among these the trunks of the gum-trees are hollowed out to form canoes. The streams abound with excellent fish, among which are mullets, pike, eels, and crayfish; the fishery on the coast also yields abundantly for the supply of the inhabitants.

The principal produce of Dominica consists of sugar (and of course rum) and coffee; the quality of the latter has a higher repute than that of any other of the West India Islands. The island is unequally divided into ten parishes. The town Roseau is in St. George's parish, on the south-west side of the island, and on a tongue of land, having Woodbridge Bay on the north and Charlotteville Bay on the south. The town is regularly built, with long and wide paved streets, which intersect each other at right angles. The roadstead is safe, although the anchorage is far from good, from October to August; but during the hurricane months a heavy sea frequently rolls in from the south. Prince Rupert's Bay, on the north-west side of the island, is at all times safe and commodious.

The population, according to a census taken in 1833, consisted of—

	Males.	Females.	Total.
Whites	382	338	720
Free coloured people	1,673	2,141	3,814
Slaves	6,802	7,324	14,126
Total,	8,857	9,803	18,660

The population of the town consisted of 244 whites, 1289 free coloured people, and 739 slaves; altogether, 2272 persons. There were in 1834, in Roseau, 3 schools, in which there were 245 children, taught according to the Madras system; there was one other school, in the parish of St. Joseph, wherein 40 children were instructed. The greater part of the inhabitants profess the Roman Catholic faith.

The shipping that arrived and sailed from the island in 1836 were as follows:—

	Arrived.			Sailed.		
	Ships.	Tons	Men.	Ships.	Tons	Men.
Great Britain	7	1,783		6	1,515	
British colonies	100	4,340		112	5,585	
United States	36	4,682		18	2,206	
Foreign ports	79	1,846		87	3,615	
Total,	222	12,651	1,154	223	12,921	1,172

The imports consist principally of plantation stores, cotton, linen, and woollen manufactures from England; corn, fish, and lumber from the British North American colonies and the United States, and live stock from the neighbouring continent of America. The exports are principally coffee, sugar, and rum. The quantities shipped in 1832, 1833, and 1834, were as follows:

	1832.	Value.	1833.	Value.	1834.	Value.
Coffee	1,360,302 lbs.	40,146*l.*	837,555 lbs.	30,701*l.*	898,891 lbs.	26,271*l.*
Sugar	6,250,992	84,792	5,256,612	78,953	5,996,928	77,228
Rum	51,100 gals.	4,607	44,097	3,238	46,090	2,875

DOMINICAL LETTER (*dies domi'nica*, Sunday). To every day in the year is attached one of the first seven letters, A, B, C, D, E, F, G; namely, A to the first of January, B to the second, &c.; A again to the eighth of January, and so on. The consequence is, that all days which have the same letter fall on the same day of the week. The *dominical letter* for any year is the letter on which all the Sundays fall. Thus, the first of January 1837, being Sunday, the dominical letter for 1837 is A. In a common year, the first and last days have the same letters, whence the dominical letter of the succeeding year is one earlier in the list: that is, the dominical letter for 1838 is G. But in leap-year, it is to be remembered that the 29th of February has no letter attached to it: whence every leap-year has two dominical letters, the first for January and February, the second for all the rest of the year, the second being one earlier than the first. The following will now be easily understood; each year is followed by its dominical letter; 1837, A; 1838, G; 1839, F; 1840, E, D; 1841, C; 1842, B; 1843, A; 1844, G, F, &c.

As it is convenient in historical reading to be able to find the day of the week on which a given day in a distant year fell, we subjoin the following tables. The middle column of figures contains the tens and units of the year in question, while the figures at the head contain the hundreds and tens of hundreds. Thus for the years 536 and 1772, look for 36 and 72 in the middle column, and for 5 and 17 at the head. On the right of the middle column is all that relates to the *old style*; on the left all that relates to the new *style*. The large letters on the left refer to years after Christ, the small letters to years before Christ.

OLD STYLE. The large letters refer to years *after* the Christian Era, and the small letters to years *before* it.								NEW STYLE.			
0 7 14 21 28 35	1 8 15 22 29 36	2 9 16 23 30 37	3 10 17 24 31 38	4 11 18 25 32 39	5 12 19 26 33 40	6 13 20 27 34 41		1 5 9 13 17 21 25 29 33 37	2 6 10 14 18 22 26 30 34 38	3 7 11 15 19 23 27 31 35 39	4 8 12 16 20 24 28 32 36 40
B*e* A*f* G*g* FE*ba*	C*d* B*e* A*f* GF*ag*	D*c* C*d* B*e* AG*gf*	E*b* D*c* C*d* BA*fe*	F*a* E*b* D*c* CB*ed*	G*g* F*a* E*b* DC*dc*	A*f* G*g* F*a* ED*cb*	1 29 57 85 2 30 58 86 3 31 59 87 4 32 60 88	B A G FE	D C B AG	F E D CB	G F E DC
D*c* C*d* B*e* AG*gf*	E*b* D*c* C*d* BA*fe*	F*a* E*b* D*c* CB*ed*	G*g* F*a* E*b* DC*dc*	A*f* G*g* F*a* ED*cb*	B*e* A*f* G*g* FE*ba*	C*d* B*e* A*f* GF*ag*	5 33 61 89 6 34 62 90 7 35 63 91 8 36 64 92	D C B AG	F E D CB	A G F ED	B A G FE
F*a* E*b* D*c* CB*ed*	G*g* F*a* E*b* DC*dc*	A*f* G*g* F*a* ED*cb*	B*e* A*f* G*g* FE*ba*	C*d* B*e* A*f* GF*ag*	D*c* C*d* B*e* AG*gf*	E*b* D*c* C*d* BA*fe*	9 37 65 93 10 38 66 94 11 39 67 95 12 40 68 96	F E D CB	A G F ED	C B A GF	D C B AG
A*f* G*g* F*a* ED*cb*	B*e* A*f* G*g* FE*ba*	C*d* B*e* A*f* GF*ag*	D*c* C*d* B*e* AG*gf*	E*b* D*c* C*d* BA*fe*	F*a* E*b* D*c* CB*ed*	G*g* F*a* E*b* DC*dc*	13 41 69 97 14 42 70 98 15 43 71 99 16 44 72	A G F ED	C B A GF	E D C BA	F E D CB
C*d* B*e* A*f* GF*ag*	D*c* C*d* B*e* AG*gf*	E*b* D*c* C*d* BA*fe*	F*a* E*b* D*c* CB*ed*	G*g* F*a* E*b* DC*dc*	A*f* G*g* F*a* ED*cb*	B*e* A*f* G*g* FE*ba*	17 45 73 18 46 74 19 47 75 20 48 76	C B A GF	E D C BA	G F E DC	A G F ED
E*b* D*c* C*d* BA*fe*	F*a* E*b* D*c* CB*ed*	G*g* F*a* E*b* DC*dc*	A*f* G*g* F*a* ED*cb*	B*e* A*f* G*g* FE*ba*	C*d* B*e* A*f* GF*ag*	D*c* C*d* B*e* AG*gf*	21 49 77 22 50 78 23 51 79 24 52 80	E D C BA	G F E DC	B A G FE	C B A GF
G*g* F*a* E*b* DC*dc*	A*f* G*g* F*a* ED*cb*	B*e* A*f* G*g* FE*ba*	C*d* B*e* A*f* GF*ag*	D*c* C*d* B*e* AG*gf*	E*b* D*c* C*d* BA*fe*	F*a* E*b* D*c* CB*ed*	25 53 81 26 54 82 27 55 83 28 56 84	G F E DC	B A G FE	D C B AG	E D C BA
DC*dc*	ED*cb*	FE*ba*	GF*ag*	AG*gf*	BA*fe*	CB*ed*	Years ending with 00.	C	E	G	BA

Example 1. What was the dominical letter of the year [illegible] (old style)? Look in the left [illegible] opposite to [illegible] which has [illegible] among the headings, and [illegible] there found is E. Hence E was the dominical letter [illegible], and the 1st of January was a Sunday.

Example 2. What is the dominical letter of [illegible]? Look in the left [illegible] opposite to [illegible] has [illegible] among its headings, and the large [illegible] is E. Hence E is the dominical letter of [illegible] the first of January was a Sunday.

Example 3. What will be the dominical letters of the [illegible]? Look in the [illegible] among the headings, and E D [illegible]. Hence E [illegible] the dominical letter [illegible] the year [illegible].

[illegible] the day of the week [illegible] the day of the week upon which a given day of the month falls. It is the list of days which have A for their letter.

January . . .	1	8	15	22	29
February . . .	5	12	19	26	..
March	5	12	19	26	..
April	2	9	16	23	30
May	7	14	21	28	..
June	4	11	18	25	..
July	2	9	16	23	30
August . . .	6	13	20	27	..
September . .	3	10	17	24	31
October . . .	1	8	15	22	29
November . .	5	12	19	26	..
December . .	3	10	17	24	31

Thus the dominical letter being E, we ask on what [illegible] the [illegible] of January [illegible]. The E being Sunday, the A [illegible] Wednesday, and July [illegible] Wednesday, whence July [illegible] Sunday.

DOMINICANS. [BLACK FRIARS.]

DOMITIA'NUS, TITUS FLAVIUS, younger son of the Emperor Vespasianus, succeeded his brother Titus as emperor, A.D. 81. Tacitus (*Histor.*, iv., 51, 68) gives an unfavourable account of his previous youth. The beginning of his reign was marked by moderation and a display of justice bordering upon severity. He affected great zeal for the reformation of public morals, and punished with death several persons guilty of adultery, as well as some vestals who had broken their vows. He also forbade under severe penalties the practice of emasculation. He completed several splendid buildings begun by Titus; among others, an Odeum, or theatre for musical performances. The most important event of his reign was the conquest of Britain by Agricola; but Domitian grew jealous of that great commander's reputation, and recalled him to Rome. His suspicious temper and his pusillanimity made him afraid of every man who was distinguished either by birth and connexions or by merit and popularity; and he mercilessly sacrificed many to his fears, while his avarice led him to put to death a number of wealthy persons for the sake of their property. The usual pretext for these murders was the charge of conspiracy or treason; and thus a numerous race of informers was created and maintained by this system of spoliation. His cruelty was united to a deep dissimulation, and in this particular he resembled Tiberius rather than Caligula or Nero. He either put to death or drove away from Rome the philosophers and men of letters; Epictetus was one of the exiled. He found, however, some flatterers among the poets, such as Martial, Silius Italicus, and Statius. The latter dedicated to him his *Thebais* and *Achilleis*, and commemorated the events of his reign in his *Silvae*. But in reality the reign of Domitian was anything but favourable to the Roman arms, except in Britain. In Mœsia and Dacia, in Germany and Pannonia, the armies were defeated, and whole provinces lost. (Tacitus, *Agricola*, 41.) Domitian himself went twice into Mœsia to oppose the Dacians, but after several defeats he concluded a disgraceful peace with their chief Decebalus, whom he acknowledged as king, and agreed to pay him a tribute, which was afterwards discontinued by Trajan; and yet Domitian made a pompous report of his victories to the senate, and assumed the honour of a triumph. In the same manner he triumphed over the Catti and the Sarmatians, which made Pliny the Younger say that the triumphs of Domitian were always evidence of some advantages gained by the enemies of Rome. In 95 A.D. Domitian assumed the consulship for the seventeenth time, together with Flavius Clemens, who had married Domitilla, a relative of the emperor. In that year a persecution of the Christians is recorded in the history of the church, but it seems that it was not directed particularly against them, but against the Jews, with whom the Christians were then confounded by the Romans. Suetonius ascribes the proscriptions of the Jews, or those who lived after the manner of the Jews, and whom he styles as 'improfessi,' to the rapacity of Domitian. Flavius Clemens and his wife were among the victims. [CLEMENS ROMANUS.] In the following year, A.D. 96, under the consulship of Fabius Valens and C. Antistius Vetus, a conspiracy was formed against Domitian among the officers of his guards and several of his intimate friends, and his wife herself is said to have participated in it. The immediate cause of it was his increasing suspicions, which threatened the life of every one around him, and which are said to have been stimulated by the predictions of astrologers and soothsayers, whom he was very ready to consult. He was killed in his apartments by several of the conspirators, after struggling with them for some time, in his forty-fifth year, after a reign of fifteen years. On the news of his death, the senate assembled and elected M. Cocceius Nerva emperor.

Coin of Domitian.

British Museum. Actual Size. Copper. Weight [illegible] grains.

The character of Domitian is represented by all ancient historians in the darkest colours, as being a compound of timidity and cruelty, of dissimulation and arrogance, of self-indulgence and stern severity towards others. He punished satirists, but encouraged secret informers. He took a delight in inspiring others with terror; and Dion relates a singular banquet, to which he invited the senators, with all the apparatus of a funeral and an execution. He is also said to have spent whole hours in hunting after and killing flies. At one time, before his becoming emperor, he had applied himself to literature and poetry, and he is said to have composed several poems and other works. (Tacitus, Suetonius, Dion, and Pliny the Younger.)

DON, the (Duna or Tuna in Tartar, and Tungaul in Calmuck), a considerable river of European Russia, and in the latter part of its course the boundary between Europe and Asia. It rises about 54° N. lat. in the small lake Ivanofskoe, in the government of Tula, close to the borders of the government of Ryazan, and thence flows in a general S.S.E. direction until it has passed Paulofsk, after skirting the southern extremity of the government of Ryazan and north-western parts of that of Tambof, and traversing the greater part of the government of Voronesh. Within these limits the Don receives the Sosva, Voronesh near Tavrof, and Sosna near Korotoyak. From Paulofsk it inclines more to the east, and quitting the government of Voronesh, enters the western districts of the territory of the Don Cossacks: soon afterwards it turns due east, and after having been joined by the Khoper at Khoperskaya, the Medveditsa near Ostrofskaya, and the Ilawla above Katchokinskaya, flows with numerous bendings until it approaches the mountains of the Volga, through which it forces a passage about forty-five miles from that river. The Don now proceeds in a south-western and then a W.S.W. direction towards its mouth, near which it receives on its right bank, above New Tcherkask, the Donetz, or Little Don, the most considerable of its tributaries, which rises above Belgorod, in the government of Kursk, and is upwards of four hundred miles in length. On its left bank the Don is joined by the Manitsh, which rises on the southern termination of the Ergeni mountains, crosses the great Caucasian steppe, flows through lake Bolshoi, and falls into the Don at Tcherkask. The Don discharges its waters by three branches into the sea of Azof, not far from Nachitshevan, Asof, and Tcherkask, about 46° 40′ N. lat. The length of its course is estimated at about 900 miles, but the distance from its source to its mouth would not exceed 490. It has a very slow current, and abounds in shallows and sand-banks, but has neither falls nor whirlpools. In spring it overflows its banks, and forms broad and unwholesome swamps; it is navigable as high as Zadonsk, and has depth of water enough from the middle of April to the end of June for the larger description of vessels, but is so shallow during the remainder of the year, that there is scarcely two feet of water above the sand-banks. Its mouths are so much choked with sand as to be unnavigable for any but flat boats. The current of its tributaries is also sluggish, and none but the Donetz are navigable. As far as Voronesh, near the junction of the Voronesh and Don, the river flows between fertile hills; but from that point until its passage through the chain of the Volga, its left bank is skirted by lowlands, and its right by a range of uplands; thence to its confluence with the Donetz, its high bank is skirted by chalk hills, and its left is bounded by a continued steppe. The waters of the Don are impregnated with chalk, and are muddy, and prejudicial to the health of those who are unused to them: they however abound in fish, though in this respect the Don is much inferior to the Volga. The Don is the Tanais of Herodotus (iv., 57) and other Greek and Roman writers. Herodotus states that the river rises in a large lake and flows into one still larger, the Maeotis, or sea of Azof. The Hyrgis, which he mentions as a tributary of the Don, appears to be the Donetz.

DON-COSSACKS, the Territory of the (or, in Russian, Donskich Kosak of Zemlia), so called from the river Don, is a free country which acknowledges the Russian sovereign as its chief, but is not reduced to the condition of a province, or organized as a government, like other parts of the empire. It lies between 47° and 51° N. lat., and 38° and [illegible] and is bounded on the north by the governments of Voronesh and Saratof, on the east by Astrachan, on the south-east by the government of Caucasia, on the south-west by the sea of Azof and the Nogay Steppes in Taurida, and on the west by the governments of Ekaterinoslaf and the Ukraine. It occupies an area of about [illegible] square miles.

The general character of the country is that of a plain, in many parts consisting entirely of steppes, especially in the south-western districts bordering on the Sal and Manitsh. The country is a continued flat, but in the north and along the banks of the Don there are slight elevations, and the south-eastern parts bordering on lake Boiskoi are traversed by the offsets of the Caucasian mountains. The rest of the country, with the exception of the parts immediately adjacent to the banks of the larger rivers, is a broad steppe, which produces abundance of excellent pasturage intermixed with [illegible] and small [illegible] streams. The whole territory does not contain a single forest, and even brushwood is only [illegible] found. The northern districts are far the best adapted for agriculture, the southern, where the soil is [illegible] and sandy, for grazing. The steppes are full of low artificial mounds and ancient tumuli, which are so numerous in some places as to give rise to the conjecture that they are the vestiges of some great and extinct race, probably of Mongolian origin, as the rude images in stone erected over some of them bear, in their features and peculiar style of head-dress, traces of that origin. Many of these mounds have been opened, and found to contain gold and silver urns, rings, [illegible], &c.

The chief river is the Don, which enters the territory in the west, winds across it to the east, and then turning suddenly round, flows through the eastern and southern districts to the sea of Azof. In its course through this country it is joined by the Khoper, Medveditsa, Ilawla, Sal, Donecz, and several minor streams. Besides these there are several other rivers which discharge their waters into the sea of Azof, such as the Kruika, Kagalnik, Yega, &c.; and there are numerous streams in the steppes, of which the greater part terminate in marshes, and are dry in summer. The principal lake is the Boiskoi, an enlarged bed of the Manitsh, about 70 miles long and 9 broad, the length of which forms for that distance the boundary between the territory of the Don-Cossacks and Caucasia. Next to this the most considerable lakes are those of Nowoe and Sieroe-Ozero, which are covered in summer with an incrustation of salt from one to two inches in thickness, of which they furnish an abundant supply. No mineral springs have yet been discovered.

The country enjoys a mild and not unhealthy climate. The spring sets in early, and in the summer, which is of long continuance, the land is refreshed by frequent showers: the autumn is at times damp and foggy, and the winter, though clear and not accompanied with much snow, is severe and attended by much stormy weather. The rivers are covered with ice from the end of November to the month of [illegible]. Failures of the harvest are rare, but the inhabitants [illegible] from the ravages of the locust, [illegible].

[illegible], the fisheries, and the cultivation [illegible] the principal occupations of [illegible] the most recent writer [illegible], agriculture, not the rearing of [illegible] have affirmed, forms the chief employment of the people. In the low-lands of the north, [illegible] of rivers, the soil is very fertile, and [illegible] of various kinds, such as rye, barley, [illegible] also peas, flax, and [illegible] are found in the heart [illegible] and even forty miles [illegible]: these [illegible]. In [illegible] quar- [illegible] were [illegible] three grains [illegible] of ia- [illegible] wheat are estimated at about [illegible] annually. [illegible], in which [illegible] melons [illegible] however an object [illegible] the vine was introduced [illegible] up with spirit, especially along the banks of the Don, where a very pleasant wine, not unlike Champaign, is made, and has become a favourite beverage in Russia. There are super[illegible] kinds, the Stanitze and Zimlyanskoye, which resem[illegible] Burgundy in colour and flavour; but the favourite spe[illegible] is the Vinomarozka, or frozen wine, which is made from a mixture of wine with brandy and the juice of vari[illegible] berries. In what is called the 'First Natshalstoe (di[illegible]trict) of the Don,' which lies east of Tsherkask, there [illegible] at present 9710 vineyards, and in the 'Second,' no[illegible] east of Tsherkask, 2590; these vineyards contain from [illegible] to 800, and even as many as 1000 vines, and about fif[illegible] different kinds of grasses. The inferior descriptions of w[illegible] are red ones, of which about 70,000 vedros (about 225,[illegible] gallons) are annually sent to Moscow, and 30,000 (ab[illegible] 96,770 gallons) to Kharkof, beside considerable quanti[illegible] to Kursk and other parts. The yearly sale of these w[illegible] produces about two millions of roubles, or 92,000*l.* sterl[illegible] The vines also yield about 10,000 vedros (32,250 gall[illegible] of brandy spirit annually.

The rearing of cattle is pursued with great industry b[illegible] by the Cossacks and Calmucks; the wealth of the more affluent among them consists, in fact, of their numer[illegible] herds and flocks, and they have large Khutors, or cattle-farms, for breeding them in the steppes. The native Cossack horse is small and spare in flesh, with a thin neck a[illegible] narrow croup; he is, on the whole, an ill-looking anim[illegible], but strong, fleet, and hardy. The common Cossack is ra[illegible] owner of less than three or four horses, but many of t[illegible] Tabunes or herds, of the wealthier breeders, contain [illegible] or more. All, with the exception of the saddle-horses, a[illegible] kept on the pasture-grounds throughout the year, and [illegible] winter are forced to seek for their food either beneath the snow or from the high reeds on the banks of rivers. The Cossack himself does not keep either camels or dromedar[illegible] but they are reared by their Calmuck fellow-countrym[illegible] and thrive well on the saline plants of the steppes. Next to the horse the sheep is the most common domestic anim[illegible] the ox is used for draught: goats are bred principally [illegible] the Calmucks: but swine and buffaloes are rare. T[illegible] stock of the Cossack population in 1832 was composed [illegible] 257,211 horses, of which 123,328 were mares, 2,1[illegible] sheep, from which 217,775 poods (about 7,839,900 pou[illegible] of wool were obtained: and 840,683 heads of horned ca[illegible] The Calmucks at that time possessed 33,747 horses, 5[illegible] heads of cattle, 25,574 sheep, and 1365 camels and dromedaries.

The chase is unproductive, as the steppes are not th[illegible] usual resort of wild animals or of much game; wol[illegible] foxes, marsh-cats, dwarf otters, martens, marmots, je[illegible] boas, a species of gazelle, and hares are occasionally [illegible] with. Of wildfowl there are the steppic-fowl (Otis tetra[illegible] water-starling, Muscovy duck, swan, snipe, pelican, [illegible] falcon. The principal amphibious animals are tortoi[illegible] The steppes also breed the Polish cochineal insect, o[illegible] which however no use is made, the silkworm, and the cantharides.

Next to agriculture the people derive their chief subsistence from their fisheries. Fish indeed is their ordinar[illegible] food, and consists of the sturgeon, trout, pike, tench, pe[illegible] salmon, carp, &c., for which the richest fishing grou[illegible] are the Don and the shores of the sea of Azof. The [illegible]duce of 1832 was 1,033,935 poods (about 37,221,660 po[illegible] weight), of which 496,512 poods were appropriated to [illegible]ternal consumption, and the remainder was export[illegible] Caviar and isinglass are sent abroad in large quant[illegible] Turtles and crabs in immense numbers, and of large [illegible] are taken in the Don and its tributary streams.

The Cossacks rear little poultry, but they keep l[illegible] stocks of bees: the number of apiaries a few years ag[illegible] 1044, which contained 30,201 hives, and produced a[illegible] 5299 poods (about 298,764 pounds weight) of honey [illegible] wax.

Trades and mechanical pursuits are carried on only [illegible] two chief towns, New and Old Tsherkask, and the lar[illegible] stanitzes, or villages: for as the Cossack depends u[illegible] himself for the supply of his daily wants, there is co[illegible]quently little encouragement for the manufacturer [illegible] mechanic. The only large manufactures are caviar, w[illegible] and isinglass. The exports are inconsiderable, and co[illegible] principally of horses, cattle, tallow, skins, glue, fish, a[illegible] their products, wine, and a little grain; the greater part [illegible] these exports are sent to Taganrog, which is the chief ma[illegible] for the sale of what the country produces, or find a vent at the periodical *fairs* of Tcherkask, &c. They amounted in 1832 to 4,941,820 rubles (about 216,600*l*.), while the imports in that year were to the extent of 14,886,151 rubles (about 650,456*l*.)

The territory of the Cossacks is divided into seven Nolchiltan, or provinces, namely, 1. Aksai, on the Don, in which are Old Tcherkask, and New Tcherkask (14,000 inhabitants), the only towns in the country; 2. The First District of the Don, containing the large villages of Troilinskaya, Rotynovskaya, Tsimlianskaya, &c.; 3. The Second District of the Don, with the large villages of Tchernskaya and Golubinskaya; 4. Medweditsa, with the large villages of Ust-Medweditsa, Berezofka, and Ostrofskaya; 5. Koperskaya, with the large villages of Urupinskaya (1900), Katolskaya and Dobrinskaya; 6. Donetzkaya, with the large villages of Kamenskaya, Luganskaya, and Mikhailofka; and 7. Miusk, with the large villages of Grabova and Alexiefkaya.

The great mass of the population are Cossacks and Little Russians, among whom a number of Great Russians, Nogay-Tartars, Gypsies, Armenians, and Greeks are intermixed. The Calmuck part of the population are a nomadic people: in 1832 their numbers were 16,413, of whom 7889 were males and 8524 females. The following is given as the official return of the remaining inhabitants of the territory:—

Bondsmen in the service of Cossack proprietors .	389,371
Free labourers, &c.	123,299
	512,670

This return does not comprise the chiefs or great landowners, or the ecclesiastics, nor probably the principal starshines or nobility; it may be concluded, therefore, that Arsenief's calculation, that the population amounts to 600,000 of all classes, is not above the mark. The census of 1796 gave 300,974, but there are reasonable grounds for questioning its correctness.

The territory of the Don Cossacks, which is more extensive than the whole area of the Austrian States in Germany, contains but two towns, and 120 stanitzes. The villages, many of which have markets, are always placed on the banks of rivers and composed of from fifty to three hundred houses, well built, clean, and conveniently arranged, with one or more churches of stone or wood. Some of these stanitzes are large, and resemble towns, and are surrounded by a wall and narrow ditch; the khutors, or stables, stalls, &c., lie outside of them. The Cossacks, who have been settled in the country since 1569, are genuine Little Russians, and speak pure Russian mixed with occasional provincialisms. They are proverbially hospitable and cheerful, but violent when excited; and although they consider the plunder of their enemy lawful in war, theft is almost unknown among them. Their mode of life is in general very simple and frugal, and the enjoyment of civil freedom has given them an independence of mind, which places them far higher in the social scale than the abject Russian. Their starshines, or nobles, are in general well educated. With regard to public instruction, their establishments are within the jurisdiction of the University of Kharkof. The state of these establishments was in 1828, 12 schools with 46 teachers and 937 pupils, and in 1832, the same number with 45 teachers and 1021 pupils, all males. Besides these, there are 5 ecclesiastical seminaries in the Eparchy of New Tcherkask, with 10 teachers and 274 students. The entire number of scholars, therefore, was 1295, which averages very nearly 1 scholar in every 380 inhabitants. But, as the Raskolniks, a sect of the Græco-Russian church, have gratuitous schools of their own, this proportion can be approximative only.

In respect of church matters, this territory was formerly dependent upon the diocese of Voronesh, but the eparchate of New Tcherkask was established expressly for it by the ukase of May, 1829: it contained in 1830 369 churches, of which 5 are cathedrals, beside three monasteries and one convent. The majority of the people are of the Russo-Greek church. The Calmucks are Lamaists, and the Nogay and other Tartars are Mohammedans.

The Cossacks are exempt from taxes, but are liable to do military duty, and are bound to dress, arm, and equip themselves entirely at their own expense, in return for which the government provides for their maintenance while in the field, allows them pay, and supplies them with field equipage. The Cossacks are unrivalled in the use of the bow and arrow, although they do not use them in war. Their principal weapon in battle is the lance. They live under a military government wholly distinct from the government of every other Russian province, at the head of which is a Voiskovoi-Attaman, or Captain-general; but as the present emperor has vested this office in the heir-apparent, his powers are delegated to a Nakaznoi or Vice-Attaman; and on this model every stanitze has its local attaman, who is elected by the inhabitants. The Cossacks have a supreme council of state, called the Chancery of the Voiskoloye, or Captaincy, which controls both the civil as well as the military affairs of the territory. The attaman or his deputy is its president, and he is assisted by two perpetual members and four other members, who are elected by the people every three years. The expenses of the administration, including the allowances to the vice-attaman, the attorney-general, and the officers attached to the attaman, amounted in 1832 to upwards of 130,000 silver rubles (about 26,000*l*.)

The Cossacks are divided into Polks, or regiments, and Sotnyes, or companies; which last are again divided into sections: each polk has a standard-bearer and a major. In return for the exemption from taxes, crown monopolies, and other privileges, they are bound to keep in a constant state of readiness for the Imperial service about 25,000 cavalry, who are reckoned among the regular Cossacks. From the age of 15 to 30 every Cossack is a soldier, and in case of pressing emergency, all males capable of service are bound to take up arms. The Calmucks are governed by the same laws, and subject to the authority of the Voiskovoi-Attaman. They are equally bound to serve with their Cossack fellow-countrymen, by whom, however, they are held in great contempt. They dwell in tents of skin, lead a wandering life, and are exclusively occupied in rearing cattle, sheep, camels, and especially horses, with which they supply the Russian light cavalry.

The Cossacks pay much attention to their dress; which consists of a blue jacket, frequently laced with gold and lined with silk, a silk vest and girdle, full white trowsers, and black woollen cap, with a large red bag dangling behind. The females, who are inferior in symmetry of form to the males, have agreeable features, a florid complexion, and fine black eyes. They wear a long falling tunic of cotton or silk, partly open in front, and confined by an ornamental waistband. Beneath this upper garment appear broad trowsers, with which yellow boots are usually worn. The hair of the unmarried female floats in long braided tresses over the shoulder, but when married she conceals it under a cap richly embroidered with gold and pearls. Their dances resemble those of the Russian gipsies, and are performed by two persons only, who accompany their movements with loud cries.

DONAGHADEE, a mail-packet station, in the barony of Ards and county of Down, in Ireland: distant 94 Irish or 119 English miles from Dublin, seventeen English miles from Belfast; and twenty-one English miles from Portpatrick, on the opposite coast of Great Britain.

Donaghadee owes its rise to being the most convenient point of communication between the latest colonists of Ards, and their countrymen in Scotland, with whom they carried on a sufficient traffic to induce the proprietor, the Lord Montgomery, about A.D. 1650, to erect a quay 128 yards in length, and from 21 to 22 feet broad, which continued during the last century to afford pretty good shelter to all the craft employed. The Scottish mails have landed here since before 1744, at which time Donaghadee enjoyed a large share of the imports and exports of this part of the country. The accommodation of the old quay being latterly found insufficient for the better class of steam-packets, as well as for merchantmen, which frequently experienced the want of an asylum harbour on this coast, a new pier was commenced at the expense of government, which is now completed, enclosing a basin of seven acres, and calculated to hold sixty vessels of the larger class. The expense has been upwards of 150,000*l*., and the work is executed in the best manner; but the benefits so far derived from it are not considered commensurate with so great a cost. The town, which consists of two principal streets, is well built and airy; it has at present a considerable export trade in cattle and grain, and a large import of coal. There are a handsome church, two Presbyterian meeting-houses, two Seceders' meeting-houses, and one Wesleyan Methodist meeting-house.

On the north-east side of the town stands a remarkable artificial mount or rath, surrounded by a dry fosse from 27 to 32 feet broad. The circumference of the mount at the bottom is 480 feet, at the top 219 feet, and its greatest conical height 140 feet. A powder magazine has been built on the summit, from which Scotland and the Isle of Man are visible in fair weather.

In 1834 there were in the parish 15 schools, educating 703 young persons: of these schools three were in connexion with the Board of National Education. Population of town in 1821, 2,795: in 1831, 2,986. (Harris's *History of the County of Down; Northern Tourist; Reports, &c.*)

DONATELLO. Donato di Belto di Bardo, called Donatello, was born at Florence in the year 1383. He was brought up in the house of a Florentine gentleman named Ruberto Martelli, a liberal patron of the arts, and received his first instructions from Lorenzo Bicci, from whom he learned painting in fresco; but he afterwards became more famous as a sculptor. He also practised architecture. In the course of his life he visited many towns of Italy, among which were Venice and Padua, where the people wanted to detain and naturalize him, and Rome. Donatello was much esteemed by his contemporaries, and executed a great number of works, both in private and public buildings, and for the grand-duke Cosmo I. He was the first to employ bas-relief in telling stories, according to the more elaborate style of Italian sculpture. He died paralytic, December 13, 1466.

When he first became so infirm as to be unable to work, the grand-duke Piero I. gave him a small estate: but he was so much annoyed by the troublesome references of his labourers, that he insisted on relinquishing it; and Piero gave him a pension instead, in daily payments, which perfectly contented him. Some relations visited him one day, for the purpose of persuading him to leave them at his death a vineyard which he owned; but he answered, that it seemed more reasonable to leave it to the peasant who had always worked upon it than to those who had done no labours for him, except paying him that visit: and he did so.

His principal works are at Florence; but some have decayed, or been removed from their original station. One, a figure of St. Mark, which was nicknamed (according to the common propensity of the Florentines) Lo Zuccone (the Gourd) on account of its bald head, is much commended. A St. George is also much esteemed; and Vasari, speaking of a Judith bearing the head of Holofernes, in bronze, calls it, with all the strength he gathered from his intense love of his art, 'A work of great excellence and mastery, which, to him who considers the simplicity of the outside, in the drapery and in the aspect of Judith, sees manifested from within it the great heart (animo) of that woman and the aid of God; as in the air of that Holofernes, wine and sleep, and death in his members, which, having lost their spirit, show themselves cold and falling.'

Donatello left several pupils, to whom he bequeathed his tools. The most noted are Bertoldo, Nanni d'Anton di [illegible] R[illegible], Disederio, and Vellano di Padova. To [illegible] he left all the works which he retained at his death. [illegible]

DONATIO MORTIS CAUSA (Law), a gift made in prospect of death. The doctrine is derived from the civil law, and a donation of this kind is defined in the Institutes [illegible] ii. 7 as 'a gift which is made under an apprehension of death, as when a thing is given upon condition that if the donor die, the donee shall have it, or that the thing given shall be returned if the donor should survive the danger which he apprehends, or shall repent that he has made the gift: or if the donee shall die before the donor.' In the English law it is necessary to the validity of this gift that it be made by the donor in relation to his dying by the illness which affects him at the time of the gift, but it takes effect only in case he die of that illness. There must be a delivery of the thing itself to the donee; but in cases where actual transfer is impossible, as, for instance, goods of bulk deposited in a warehouse, the delivery of the key of the warehouse is effectual. A donatio mortis causâ partakes of the nature of a legacy so far as to be liable to the debts of the donor, and, by [illegible] Geo. III. c. 52, § 7, to the legacy duty; but as it takes effect from the delivery, and not by a testamentary act, it is not within the jurisdiction of the ecclesiastical court, and neither probate or administration is necessar nor the assent of the executors, as in the case of a legac

On the Roman donatio mortis causâ the reader m consult Heineccius, *Op.*, tom. vi., p. 581, and the referenc there given; and the Pandect, xxxix., tit. 6. The Con tution of Justinian put donations mortis causâ very nea on the footing of legacies in the Roman law.

As to the English law, see Roper *on Legacies*, vol. i.

DONATISTS, Christian schismatics of Africa, of t fourth century, originally partisans of Donatus, bisho Casa Nigra in Numidia, the great opponent to the elec of Cecilianus into the bishopric of Carthage. Don accused Cecilianus of having delivered up the sacred b to the Pagans, and pretended that his election was the void, and all those who adhered to him heretics. Und this false pretext of zeal he set up for the head of a par and, about the year 312, taught that baptism administer by heretics was ineffectual; that the church was not fallible; that it had erred in his time; and that he was be the restorer of it. But a council held at Arles, in 31 acquitted Cecilianus, and declared his election valid. Th schismatics, irritated at the decision, refused to acquiesc the sentence of the council; and the better to support t cause, they thought it proper to subscribe to the opinion Donatus, and openly to declaim against the Cath They gave out that the church was become prostitut they re-baptized the Catholics; trod under foot the h consecrated by priests attached to the Holy See; bur their churches; and committed various other acts of viole They had chosen into the place of Cecilianus one Ma nus, but he dying soon after, they brought in another D natus, different from him of Casa Nigra, as bishop of C thage.

It was from this new head of the cabal, who used much violence against the Catholics, that the Donatists believed to have received their name. As they could prove, however, that they composed a true church, bethought themselves of sending one of their bishop Rome. They attempted likewise to send some bishops Spain, that they might say their church began to spr itself everywhere.

After many ineffectual efforts to crush this schism, emperor Honorius ordered a council of bishops to asse at Carthage in the year 410, where a disputation was between seven of each party, when it was decided that laws enacted against heretics had force against the D tists. The glory of their defeat was due to St. August bishop of Hippo, who bore the principal part in this con versy. The Donatists, however, continued as a separ body, and attempted to multiply their sect even in the century; but the Catholic bishops used so much wis and prudence that they insensibly brought over m those who had strayed from the bosom of the church. church of the Donatists gradually dwindled to nothing, became quite extinct in the seventh century. (Brough *Dict. of all Religions*, fol. Lond., 1756, pp. 340, 341; M heim's *Eccl. History*, 4to. Lond., 1765, vol. i., pp. 21 259, 305; Moreri, *Dict. Historique*, fol., Paris, 1759, tom p. 214.)

DONATIVE. [BENEFICE, vol. iv., p. 220.]

DONATUS, ÆLIUS, a celebrated grammarian, w lived in the middle of the fourth century. He wro Grammar, which long continued in the schools; and a Notes upon Terence and Virgil. He was most eminent the time of Constantius, and taught rhetoric and polite l rature at Rome in the year 356, about which time St. Je studied grammar under him. Donatus has given an employment to the bibliographers, who all speak of 'Editio Tabellaris sine ulla nota' of his Grammar, as one the first efforts at printing by means of letters cut on wood blocks. (See Meerman, *Origines Typograph.* of this a other editions, 4to., Hag. Com. 1765, tom. i. pp. 126, 132 pp. 107, 215, 218.) This Grammar has been printed u several titles, as 'Donatus,' 'Donatus Minor,' 'Donat Ethimolyzatus,' 'Donatus pro puerulis,' &c., but the work the same, namely, 'Elements of the Latin Language for t use of Children.' In the volume of the Grammatici Veteres printed by Nic. Jenson, without date, it is entitled 'Dona de Barbarismo et de octo partibus Orationis.' Dr. Clarke in his 'Bibliographical Dictionary,' vol. iii. p. 144-148, h given a long list of editions of Donatus, to which the m inquisitive reader is referred. Donatus's 'Commentar quinque Comœdias Terentii,' were first printed without dat probably before 1450, and reprinted in 1473 and 1476. The 'Commentarius in Virgilium,' fol., Ven., 1529, though ascribed to him, is thought by many not to be his.

Donat, in the middle ages, both in English and French, became a synonym for any system of grammar; as in Piers Ploughman—

'Then drough I me among drapers my Donat to lerne.'

In the statutes of Winchester College, written about 1386, a grammar is called 'Antiquus Donatus,' the old Donat. Cotgrave quotes an old French proverb, 'Les Diables estoient encores en leur Donat,' the devils were but yet in their grammar. (See Harles. *Introd. in Hist. Ling. Latinae*, Brem. Bremae, 1773, pp. 202, 203; Clarke, *Bibliogr. Dict.*, in voce; Warton's *Hist. Eng. Poet.*, 4to., vol. i. p. 281; Chalmers's *Biogr. Dict.*, vol. xii. p. 241.)

DONAX. [CONCHACEA, vol. vii., p. 428.]

DONCASTER, a market-town, borough, and parish in the West Riding of the county of York, in the wapentake of Strafforth and Tickhill. It is situated on the river Don, on the great north road, which passes through the whole length of the town; it is 162 miles north-north-west of London, and 37 miles south-by-west of York. Doncaster was the *Danum* of Antoninus, and was called *Dona Caester* by the Saxons, from which its present name is derived. Doncaster is one of the cleanest, most airy, and most beautiful towns in the kingdom. The approach from London, by a wide and nearly level road, ornamented with ancient elm-trees, is magnificent. The town stands on the Watling-street of the Romans. Coins, urns, and other Roman remains are occasionally dug up in various parts of the town and neighbourhood.

Under the Municipal Reform Act the borough is divided into three wards, with six aldermen and eighteen councillors; it has also a commission of the peace. The clear income of the corporation is about 8000*l.* per annum, of which large sums are expended in lighting, paving, cleansing, and watching the town, in repair of roads, improvement of the estates, police expenses, and in contributions to various charities. The air is considered remarkably pure and salubrious, and this circumstance, combined with its advantageous situation and its comparative freedom from local assessment, renders it a desirable residence for persons of limited income. The population of the borough was, in 1801, 5697; in 1811, 6935; in 1821, 8544; in 1831, 10,039. The population of the townships in the soke of Doncaster, including Hexthorpe-with-Balby, Loversal, Rossington, Auckley, Blaxton, and Wheatley-with-Sandall, was, in 1831, 1799.

Doncaster has a few iron foundries, a sacking and a linen manufactory on a small scale. In 1787, Dr. Cartwright introduced the manufacture of muslins by power-looms, of which he was the inventor, into the town; but the attempt to make Doncaster a manufacturing town was unsuccessful. As the centre of a large agricultural district, the markets and fairs are attended by a large rural population, who contribute greatly to its support. Although it is one of the largest corn-markets in the kingdom, there is no corn-exchange; a spacious area between the shambles and the cattle-market is used for the sale of corn. The town also derives support from the numerous opulent families residing in its vicinity, and from the continual intercourse on the north road. Though the navigation of the Don renders it an eligible situation for general traffic between the manufacturing districts and the eastern coast, no advantage has yet been taken of the facilities thus afforded for making it a place of trade.

The public buildings in Doncaster are the mansion-house, a handsome structure, which has cost about 10,000*l.*, and which is used for the meetings of the corporation, for concerts, assemblies, and occasionally for public meetings; the town-hall, in which the quarterly sessions for the borough and the annual sessions for the wapentake are held; the gaol, which is built on the improved principle for the classification of prisoners, a betting-room, and a theatre. The stand, on the race-ground, may also be considered as one of the public buildings; it was erected at the expense of the corporation, and is both elegant and commodious. The stand tickets sold during the race week produce an income of about 1200*l.* a year. The churches of Doncaster are, the parish church, dedicated to St. George, and Christ Church. The former is a spacious and elegant cruciform structure, with a fine square tower, 141 feet high. The various details of the exterior and interior are profusely fine, and well deserving of the attention of the antiquary. Christ Church was erected a few years ago from a fund left for that purpose by the late John Jarratt, Esq. The spire was 130 feet high; in November, 1836, it was struck by lightning, the tower was much injured, and that part of the edifice is at present (May, 1837) a mass of ruins. The interior is uninjured, and the service has not been interrupted by the accident. The living of the parish church is a vicarage, in the archdeaconry and diocese of York, and in the patronage of the archbishop of York. Christ Church is a perpetual curacy, in the gift of the trustees of the late Mr. Jarratt. The dissenting places of worship are for Friends, Methodists, Independents, Catholics, and Presbyterians.

The educational establishments are numerous. There are many boarding-schools for both sexes, a grammar-school, a national-school, a British-school, and six Sunday-schools. All these schools are well supported. The number of pupils instructed in Sunday-schools exceeds 1000; they are taught by 130 teachers and superintendents. The Yorkshire Institution for the Deaf and Dumb is situated near the race-course: it is a school of instruction and industry. (DEAF AND DUMB.) Other institutions are the Subscription Library, the Mechanics' and Apprentices' Library, and the Lyceum Literary and Scientific Society. A valuable library also belongs to the church, which is accessible to all the inhabitants. The public charities which belong to the town are numerous. St. Thomas's Hospital, endowed in 1588 by Thomas Ellis, is an asylum for six "poore and decayed housekeepers of good name and fame." Its present income is 335*l.* 2*s.* 6*d.* a year. Quintin Kay's charity of 100*l.* per annum, is chiefly devoted to the relief of poor and reduced persons, and to the apprenticing of six poor children to mechanical or handicraft trades. Jarratt's charity is for the relief of six reduced housekeepers. There are several other bequests for purposes similar to those enumerated. The other charities in Doncaster are the dispensary, the lying-in, clothing, sick, and soup charities. The total number of accounts kept at the Doncaster savings' bank in November 1836 was 2050, amounting to 51,711*l.* 9*s.* 6*d.*

The races at Doncaster are held in the third week of September, and continue for five days. It is said that they are a source of great emolument to the town, but this is very doubtful. It is certain that they are productive of great immorality, not only among the casual visitors, but also among the permanent residents. The race-ground, which is about a mile from the town, is perhaps unrivalled. The St. Leger stakes excite great interest not only throughout the kingdom, but in all parts of the world. The municipal body subscribes largely to the maintenance of the races, under the idea that they tend to the prosperity of the town. Potteric Car, on the south of Doncaster, was a morass of many miles in extent, till the year 1766. It is now completely drained, and yields luxuriant crops.

DONEGAL, a maritime county of the province of Ulster in Ireland; bounded east and south on the inland side by parts of the counties of Londonderry, Tyrone, Fermanagh, and Leitrim; and on the south-west, west, and north, by the Atlantic Ocean. Greatest length from Inishowen head on the north-east, to Malin Beg head (sometimes called Teelin head,) on the south-west, 85 statute miles; greatest breadth from Fearn-hill on the south-east to Horn Head on the north-west, 41 statute miles. Area according to Ordnance survey of Ireland, consists of—

	a.	r.	p.	
Land	1,170,335	2	31	
Water	23,107	0	11	
Total	1,193,442	3	2	Statute measure.

Or, about 1865 square miles.

Gross population in 1831, 289,149.

Donegal forms the north-western extremity of Ireland. The inland boundary preserves a general direction of south-west by north-east, and from Lifford northward is formed by the navigable river and harbour of Loch Foyle. The maritime boundary is extremely irregular, being deeply indented on the north by the estuaries of Loch Swilly, Mulroy, and Sheephaven, and on the south by Donegal bay. The whole county is uneven and mountainous, with the exception of the midland district extending from the liberties of Londonderry westward to Letterkenny and Rathmelton, on Loch Swilly, and southward along the Foyle to Lifford and Castle Finn; and some other mounsiderable tracts around Ballyshannon and Donegal on the south, and Dunfanaghy and Buncrana on the north. The mountain groups of Donegal together with the highlands of Tyrone and Derry present a deeply withdrawn amphitheatre to the north-east, enclosing the basin of the Foyle. That portion of the mountainous circuit which lies within this county is broken only in the north by the openings of Loch Swilly and Mulroy Bay; and on the south (where the connecting highlands of Donegal and Tyrone are narrowed between the valley of the Finn and the Bay of Donegal) by the gap of Barnesmore. Slieve Snaght, which rises to a height of 2019 feet in the centre of the peninsula of Inishowen, forms the extremity of this chain on the north. Westward from Slieve Snaght and similarly situated in the centre of the peninsula of Fanad between Loch Swilly and Mulroy Bay, is Knockalla (1196 feet); backed in like manner by Loch Salt mountain (1541 feet), between the head of Mulroy Bay and the low country stretching inland from Sheep Haven. Westward again from the Sheep Haven is Muckish, 2190 feet in height, which slopes down on the north to the promontory of Horn Head; and Carntreena, (1396 feet), which extends to the sea at Bloody Foreland. Southward from Muckish stretches a vast region of highlands, which expands towards the west in wide-extended tracts of bog, interspersed with small lakes and covered with black heaths down to the sandy beach of the Atlantic: on the east it presents a series of bold continuous eminences overhanging the basin of the Foyle. The chief eminences of the chain are Erigal and Dooish on the north, the first 2462 feet in height (the highest ground in the county), the second 2143 feet; and Bluestack and Silverhill on the south, 2213 and 1967 feet respectively. From Bluestack extends a series of considerable elevations westward, along the northern boundary of the bay of Donegal, which terminate in the precipices of Slieve League, and the promontory of Malin Beg; the Barnesmore mountains sweeping eastward continue the chain into Tyrone. This mountainous tract covers upwards of 700 square miles, or more than twice the area of the county of Carlo It contains several spots of great interest to the tourist; such as Loch Salt, the prospect from which over Horn Head and Tory Island has been justly celebrated, and Glen Veagh, under the eastern declivity of Dooish, where cliffs of 1000 feet hang for upwards of two miles over a glen and lake; the opposite bank being clothed with a natural forest which is still the retreat of the red deer.

From the liberties of Londonderry northward, the coast of Loch Foyle between the mountains of Inishowen and the sea, is well inhabited and improved. Muff, close to the county boundary, and Moville, near the mouth of the Loch, are much frequented, the latter especially by the citizens of Derry during the bathing season. From Inishowen Head at the entrance of Loch Foyle, the coast, which from this point is very rocky and precipitous, bends north-west to Malin Head, the most northern point of this county and of Ireland. The cliffs at Inishowen Head are 313 feet in height: at Bin Head, about half-way between Culdaff and Malin, they rise to the altitude of 814 feet above the sea. On the Loch Swilly side of the peninsula the coast is low, and in many places covered with sand, which the north-westerly gales heap up in immense quantities on all the exposed beaches of this coast. Loch Swilly extends inland upwards of twenty miles, and forms a spacious and secure harbour: the average breadth is about one mile and a half, and the inner basin is completely land-locked; but the vicinity of Loch Foyle, which floats vessels of 900 tons up to the bridge of Derry, renders Loch Swilly of less importance as a harbour. On the river Swilly, a little above its entrance into the Loch, stands Letterkenny, a thriving town, which supplies most of the country to the westward with articles of import. Rathmelton, and Rathmullen are situated on the western shore of the Loch, the latter nearly opposite Buncrana, and all in the midst of well improved vicinities. The rise of spring tides opposite Buncrana is 18 feet. Westward from Loch Swilly, the coast of Fanad, which is peninsulated by the Bay of Mulroy, is very rugged, and in many parts overspread with sand blown in between the higher points of rock. The Bay of Mulroy is encumbered with sand-banks and intricate windings: it extends inland upwards of ten miles, and is completely land-locked, being scarcely half a quarter of a mile wide at the entrance. The small peninsula of Rosguill intercepted between this bay and Sheep Haven, has been almost obliterated by the sands which have been blown in here within the last century. Rosapenna-house, built by Lord Boyne, on the neck of the isthmus, with all its demesne, gardens, and offices, has been buried to such a depth, that the chimneys of the mansion-house some years since were all that was visible. On the opposite shore of Sheep Haven stand Doe Castle, and the house and demesne of Ardes, the most remote, and at the same time the most splendid seat in this quarter of Ulster. On a creek of Sheep Haven is the little port-town of Dunfanaghy, immediately under Horn Head, which rises north of it to the height of 833 feet, with a cliff to the ocean of 626 feet. On the western side of Horn Head is a perforation of the rock known as Mc Swine's Gun: when the wind sets in from the north-west, the sea is driven into this cavern with such violence as to rise through an opening of the rock above in lofty jets, with a report which, it is said, may be heard at a distance of many miles. In the sound between Horn Head and Bloody Foreland are the islands of Innisboffin, Innishdoony, and Tory Island, which last is at a distance of eight miles from the shore. Tory Island is three miles and a half in length, by half a mile to three quarters in breadth, and is inhabited by perhaps the most primitive race of people in the United Kingdom. In 1821 the island contained 59 houses and 296 inhabitants, few of whom had ever been on the main land. It is stated by the only tourist who has given an account of his travels through this remote district, that seven or eight of the inhabitants of Tory having been driven by stress of weather into Ardes Bay about the year 1825, 'Mr. Stewart of Ardes, gave these poor people shelter in a large barn, and supplied them with plenty of food and fresh straw to lie on;—not one of these people was ever in Ireland before; the trees of Ardes actually astonished them—they were seen putting leaves and small branches in their pockets to show on their return. Mr. Stewart had the good nature to procure a piper for their amusement, and all the time the wind was contrary those harmless people continued dancing, singing, eating, and sleeping—a picture of savage life in every age and clime.' (*Sketches in Ireland* by the Rev. Cæsar Otway, p. 13.) The average elevation of the western part of the island is no more than from 50 to 60 feet above the level of the sea, and the want of shelter is felt very severely in those north-westerly gales which set in with such violence on this coast. In the summer of 1826, it is said, a gale from this quarter drove the sea in immense waves over the whole flat part of the island, destroying the corn and washing the potatoes out of the furrows.

From Bloody Foreland south to Malin Beg Head, a distance of 40 miles in a straight line, nothing can be more desolate than the aspect of the western coast of Donegal. Vast moors studded with pools of bog water descend to the Atlantic between barren deltas of sand, through which each river and rivulet of the coast winds its way to the sea. In winter when these sandy channels are overflowed, it is impossible to proceed by the coast line, as there are no bridges over any of the larger streams north of the village of Glanties. The wildest part of this district is called the Rosses, in which the village of Dunglo or Cloghanlea containing, in 1821, 253 inhabitants, is the principal place. A great number of islands lie off the coast separated from the main-land, and from one another by narrow sounds and sand-banks. Of these, eleven are inhabited; of which the principal are Aranmore, or the north Island of Aran, containing in 1821, 132 houses and 788 inhabitants; Rutland or Innismacdurn, containing [illegible] houses, and 173 inhabitants; Innisfree, containing [illegible] houses, and 171 inhabitants; and Owney, containing [illegible] houses and 76 inhabitants. The cause of so dense a population in this desolate country is the success of the herring fishing here in 1784 and 1785, when each winter's fishery was calculated to have produced to the inhabitants of the Rosses a sum of 40,000*l*., who loaded with herrings upwards of 300 vessels in each of these years. These successes induced the government, in conjunction with the Marquis of Conyngham the proprietor, to expend, it is said, 50,0[illegible] in the improvements necessary to erect a permanent fishing station on the island of Innismacdurn. A small town was built and called Rutland, but it was scarcely completed when the herrings began to desert the coast; at the same time the sands began to blow, and have since continued to accumulate to such a degree that at present the island is nearly half covered, and the fishing station quite obliterated. Below high-water mark on the coast of Innisfree grows a marine grass peculiarly sweet and nutritive for cattle, which watch the ebb of the tide and feed upon it at every low water.

The district of the Rosses is separated from the more reclaimed country about Glanties and Ardara, on the south by the river Gweebarra, the sandy channel of which is from a mile and a half to a quarter of a mile in breadth throughout the last eight miles of its course, and can only be passed by fording in dry weather. On the whole line of coast from Bloody Foreland to Malin Beg Head there is but one gentleman's seat: this is at Ardara, a village at the head of Loughrosmore Bay, from which there is a pretty good communication over the heights that stretch from Bluestack to Malin Beg, with Killybeggs and Donegal. Westward from Ardara, the coast again becomes precipitous, being lined with cliffs from 500 to 600 feet in height on the northern side of the great promontory terminated by Malin Beg Head. The loftiest cliffs, however, on the whole line of coast are those of Slieve League immediately east of Malin Beg, where the height from the sea to the summit of the shelving rock above is at one point 1964 feet. Eastward from Slieve League to the town of Donegal, the northern shore of Donegal Bay affords excellent shelter from the north-west gales in the successive creeks of Teelin Bay, Fintragh Bay, Killybeggs Bay, Mc Swine's Bay, and Inver Bay. Of these the harbour of Killybeggs is by much the most sheltered and commodious, being the only one secure from a gale from the west or south-west. The harbour of Donegal itself at the head of the bay is sufficiently good for a much more trading place; and ten miles south from it is the embouchure of the navigable river Erne, which flows from Loch Erne through Ballyshannon. [BALLYSHANNON.] Four miles from Ballyshannon on the coast, at the junction of the counties of Donegal and Leitrim, is Bundoran, a fashionable watering-place, much frequented by the gentry of the neighbouring counties. Round the head of Donegal Bay from Killybeggs to Bundoran, cultivation extends more or less up all the seaward declivities: the neighbourhood of Ballyshannon is well improved; and north-east from the town of Donegal a good tract of arable land stretches inland to the picturesque lake of Loch Eask, and the Gap of Barnesmore, where a mountain defile about seven miles in length connects it with the south-western extremity of the district of the Foyle at Ballybofey and Stranorlar, two thriving villages on the Finn.

The Finn, which is the chief feeder of the Foyle on this side, issues from a lake 438 feet above the level of the sea, situated in the centre of the mountain chain extending south from Erigal, and after a course of about thirty miles eastward, joins the Foyle at Lifford bridge, eight miles below Castlefinn, where it is navigable for boats of 14 tons. Other feeders of the Foyle, out of Donegal, are the Derg, which comes from Loch Derg in the south-east extremity of the county of Donegal and joins the main stream in Tyrone; the Deele, which has a course nearly parallel to the Finn, and descends upwards of 800 feet in its course from Loch Deele to the Foyle, which it joins a mile below Lifford; and the Swilly burn or brook, which passes by Raphoe, and is navigable for a few miles above its junction. Loch Derg is about 2¼ miles wide each way, and surrounded on all sides except the south by steep and barren mountains: it is 467 feet above the level of the sea, and its greatest depth is 75 feet. This lake is subject to violent gusts of wind. It abounds in excellent trout. The Swilly river, although it has a course of little more than fifteen miles, brings down a good body of water through Letterkenny to Loch Swilly. The Leannan river, which likewise flows into Loch Swilly by Rathmelton, is a considerable stream, as is also the Lackagh, which discharges the waters of the lakes of Gartan, Loch Veagh, Loch Salt, and Glen Loch into Sheep Haven. The waters of Loch Salt, which is perhaps the deepest pool in Ireland, descend 731 feet in a course of little more than three miles to Glen Loch. Of the rivers of the western coast the chief is the Gweebarra already mentioned: of a similar character is the Gweedore, which separates the Rosses on the north from the district of Cloghanealy. The Owenea, which flows through Ardara, is the only other considerable river on this coast; the minor streams issuing from small lakes, and the torrents which descend from the moors in winter, are almost innumerable.

The general direction of all the valleys which intersect the highlands of Donegal is north-east and south-west, and this natural disposition marks out the three chief lines of mountain road; viz., from Ballyshannon and Donegal to Lifford and Londonderry, through the gap of Barnesmore; from Ardara to Lifford and Letterkenny, by the head of the Finn; and from Dunfanaghy and the cultivated country about Sheep Haven into the Rosses, by the passes between Dooish and Erigal. These latter roads are little frequented, so that west of Enniskillen the gap of Barnesmore is the only ordinary communication between Connaught and Ulster. The district along the Foyle and round the head of Loch Swilly is as well supplied with means of communication by land and water as any other part of Ireland. Throughout the county the roads are good.

The climate of Donegal is raw and boisterous, except in the sheltered country along the Foyle. The prevalent winds are from the west and north-west, and the violence with which they blow may be estimated from the effects of the storm of December 4, 1811, in which His Majesty's ship *Salhander* was lost in Loch Swilly. The maws and gills of all the fish east on shore—eels, cod, haddock, lobsters, &c.—were filled with sand; from which it would appear, that by the furious agitation of the sea, the sand became so blended with it, that the fish were suffocated. Eels are fished in fifteen fathoms, and cod in twenty to thirty; hence making allowance for their approach nearer shore before the storm, we may judge of the depth to which the agitation of the water descended: the ordinary depth in a gale of wind is seven feet below the surface, and in a heavy storm twelve to fourteen feet. (*Geological Transactions*, iii. c. 13.) From the remains of natural forests in many situations where no timber will at present rise against the north-west blast, it has been inferred that the climate is now more severe than it formerly was, a conjecture which would seem to be corroborated by numerous ruins of churches and houses, overwhelmed by sand blown in on situations where, had such events been common at the time of their foundation, no one would have ventured on building. The deposit of sand at the bottom of the sea is daily increased by the detritus of loose primitive rock brought down by every river of the coast; so that with each succeeding storm a greater quantity may be expected to be blown in, until the whole coast becomes one sandy desert, unless the danger be obviated by timely plantations of bent grass and the extirpation of those multitudes of rabbits whose burrows now extend, in many places, for several miles along the shore, and prevent the natural grasses from binding down the loose matter.

The Floetz limestone-field, which occupies the central plain of Ireland, extends over the borders of this county from Bundoran, where the limestone cliff rises to the height of 100 feet over the Atlantic, ten miles north-east to Ballintra, where the extreme edge of the stratum is perforated by a subterraneous river. Limestone gravel is also found along the flanks of the primitive district as far as some miles north of Donegal town, and to the presence of this valuable substance may be chiefly attributed the cultivation which distinguishes this part of the county from the steril tract that separates it from the basin of the Foyle. From the mountains of Barnesmore, north, the whole formation of this county, with the exception of the transition tract along the basin of the Foyle, is primitive.

The prevalent rocks are granite and mica slate, passing into gneiss, quartz slate, and clay slate. The granite is a coarse granular syenite, the detritus of which gives a strong reddish tinge to the sands washed down by the streams that traverse it. It occurs supporting flanks of mica-slate along the whole line of mountains from Loch Salt to Barnesmore. On the eastern flanks of this range the mica slate passes into greywacke, which forms the substratum of the valley of the Foyle: the same rock occurs over the lower parts of Inishowen, and also appears on the southern side of the range near Donegal town. Granular limestone is found in beds throughout the whole mountain district in great quantity and variety of colour, as among various other indications, grey at Malin Head; greyish-blue at Loch Salt; fine granular, pearl-white, pearl-grey, flesh-red, and bright bluish-grey, at the marble hill near Muckish; yellowish-white, greyish-white, and rose-red, at Ballymore; pearl-white and pale rose colour at Dunlewy, under Erigal; pearl-grey in extensive beds at the head of the river Finn; and greyish fine blue at Killybeggs. Siliciferous, magnesian, and marly limestone also occur in various parts of the baronies of Inishowen and Raphoe, with a remarkable steatite near Convoy, on the Deele, which cuts under the knife like wood, and is used by the country people for the bowls of tobacco-pipes. Beds of greenstone and greenstone porphyry are sometimes found resting on the deposits of granular limestone, and occasionally on the mica slate and granite, and the dikes from which these originate may be seen traversing the primitive rock at Horn Head and Bloody Foreland. Among the rarer minerals occurring in this remarkable region are columnar idocrase, malacolithe, epidote, and essonite (cinnamon stone), from a bed of mica slate in the Rosses, and from the bar of the Gweebarra river; garnet in hornblende slate over the marble of Dunlewy; and cherry-red garnet from Glanties: also plumbago from the shore of Ardes; copper pyrites from Horn Head; lead earth and iron ochre from Kildrum, in Cloghaneely; pearl-grey and yellowish-white porcelain clay from Aranmore Island; potter's clay from Drumardagh, on Loch Swilly; iron pyrites from Barnesmore; lead ore from Finntown, Letterkenny, Glentogher, and various other places; and pipe-clay from Drumboe, near Stranorlar. The white marble of Dunlewy, near the mountain Erigal, is stated to be of an excellent quality, and its bed very extensive; it has been traced over a space of half a mile square, and is so finely granular, that it may be employed in the nicest works of sculpture. 'Its texture and whiteness,' says Mr. Griffith, 'approach more to those of the Parian than of the Carrara marble. It is very well known that perfect blocks of the Carrara marble are procured with great difficulty, and I firmly believe that the marble of Dunlewy is free from mica, quartz grains, and other substances interfering with the chisel, which so frequently disappoint the artists who work upon the marble from Carrara.' A large supply of fine siliceous sand was formerly drawn from the mountain of Muckish by the glass-houses of Belfast, and considerable quantities have been of late exported to Dunbarton for the manufacture of plate and crown glass: the sand is rolled down the hill in canvas bags.

The soil of the primitive district is generally cold, moory, and thin. The limestone tract from Ballyshannon to Donegal is covered with a warm friable soil, varying from a deep rich mould to a light-brown gravelly earth. The soil of the transition district, arising chiefly from the decomposition of slaty rock, is a light but manageable clay, which is very well adapted for crops of potatoes, flax, oats, and barley, and in some situations, as along the rivers Finn and Foyle, bears wheat abundantly. The ordinary rotation of crops in the limestone district is potatoes, oats, or on the sea-coast, barley, and flax: on the cold lands of the western coast potatoes and barley, and among the mountains, potatoes and oats. Alternate green crops and house-feeding have been practised by some of the leading gentlemen farmers since before [illegible], but the practice is not general. The loy, or crooked spade, and old wooden plough, are still in common use in the highland districts. Donegal is not a grazing country: the good land is almost all under tillage; and the grasses of the remainder are generally too sour for feeding. Cattle grazing on the mountain districts are liable to two diseases, the [illegible] or crippling, and *galar* [illegible], which are said to alternate as the cattle are removed from the higher to the lower pastures: horses are not subject to these diseases. The Raphoe and Tyr[illegible] farming societies originated about A.D. 1800, and have been of some service in the encouragement of green crops and [illegible]. The principal plantations are at Ardes and [illegible] a fine seat near Stranorlar, where Mr. Stewart, the [illegible] has a nursery of sixteen acres. Two thousand larch-trees, each measuring at [illegible] feet from the butt, from two feet to two feet ten inches in girth, are at present (April, 1837) for sale in the latter neighbourhood. This is the first home growth of timber offered for sale in Donegal. The trees have been grown on steep and poor land, and are good evidences of the capabilities of the waste lands of this county.

The linen manufacture is carried on to a very considerable extent, and is still increasing in the cultivated country about Raphoe and Lifford, and also in the neighbourhood of Ballyshannon. Bleachgreens are numerous in the neighbourhood of Stranorlar, but spinning by machinery has not yet been introduced. Strabane, in the county of Tyrone, within two miles of Lifford, is the principal linen market for the southern district: the sale here averages 500 pieces weekly. Londonderry and Letterkenny are the markets for the district to the north: the weekly sale in the former place is about 400, and in the latter about 120 pieces. The manufacture of stockings by hand formerly employed many females on the western coast, a pair of Boylagh knit woollen stockings selling for seven shillings, but the common wear of trousers has now taken away the demand. Burning kelp continues to be a profitable occupation along the coast. About the beginning of the present century, private distillation was carried on to an immense extent all over this county, particularly in the baronies of Inishowen and Kilmacrenan: repeated baronial fines and the vigilance of the authorities have latterly checked the practice, but it still exists to some extent in the mountain districts. Considerable numbers of whales have from time to time been taken off this coast; but this, as well as the herring fishery, is now neglected. In 1802 there were but two flax-mills in this county. There is an export of three to four thousand tons of corn annually from Letterkenny, and the remaining export of the county is from Londonderry. The condition of the peasantry in the south and west is not much better than that of the wretched inhabitants of northern Connaught: land is let exorbitantly high; 3l. 5s. per acre is paid in the neighbourhood of Donegal town, and 1l. and 18s. on the declivities of the mountain district. All the butter and eggs of the poorer farmers go to market to make up the rent, and buttermilk and potatoes constitute their diet. The traveller is much struck with the improved appearance of the peasantry north of the gap of Barnesmore. 'A ragged, rather than a whole coat,' says Mr. Inglis, vol. ii. p. 109, 'was now a rarity, and the clean and tidy appearance of the women and girls was equally a novel as it was an agreeable sight. The farm-houses too were of a superior order: most of the houses had inclosures and clumps of sheltering trees.' The majority of the population in this district is Protestant.

Donegal is divided into six baronies; Tyrhugh on the south, Bannagh and Boylagh on the west, Kilmacrenan on the north-west, Inishowen on the north-east, and Raphoe on the east and centre. Ballyshannon (pop. 3775), Killybeggs (pop. 724), and Donegal (pop. 830), were erected into corporations in the reign of James I.: these corporations are now extinct. Lifford, which is the assize town of the county, is governed by a charter of the 27th February, 10th James I. This corporation still possesses some property, and has a court of record with jurisdiction to the amount of five marks, but no criminal jurisdiction. The vicinity of Strabane has prevented Lifford from increasing: the court-house and county gaol constitute the greater part of the town: pop. 1096. The other towns are Letterkenny, pop. 2168; Rathmelton, pop. 1783; Buncrana, pop. 1059; Ballybofey, pop. 874; and Stranorlar, pop. [illegible]. Donegal is represented in the imperial parliament by two county members.

Table of Population.

Date.	How ascertained.	No. of Houses.	No. of Families.	Families chiefly employed in Agriculture.	Families chiefly employed in Trade, Manufactures, and Handicraft.	Families not included in preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort	23,531	..	..	..	..	..	..	..
1821	Under Act 55 Geo. III. c. 120	44,900	45,050	..	..	..	120,559	[illegible]	[illegible]
1831	Under Act 1 Wm. IV. c. 19	[illegible]	[illegible]	38,178	7,304	[illegible]	[illegible]	[illegible]	[illegible]

The ancient name of Donegal down to the plantation of [illegible] was [illegible] the [illegible] of Donegal [illegible] O'Boyles in Boylagh and the Rosses, the MacSweenes [illegible] Banagh [illegible] and the O'D[illegible] Inishowen. Previous to the fifteenth century, Inish[illegible] been in the possession of the Mac Loughlins, a family of the Kinel Owen or O'Neills. The most distinguished of the chieftains of Tyrconnell was Hugh O'Donnell, surnamed the Red, whose entrapment by Sir John Perrot, and subsequent imprisonment at Dublin as a hostage for the good conduct of his clan, caused much hostility against the government of Queen Elizabeth in this part of Ulster. O'Donnell, after more than three years' confinement, escaped, and with much risk made his way through the English pale and reached Dungannon, the residence of the disaffected earl of Tyrone. Here, it is supposed, the plan of the great rebellion, commencing with the attack on the fort of the Blackwater [Blackwater], was originally formed. From Dungannon he proceeded to Ballyshannon, the residence of his father, who immediately resigned the chieftainship into his hands. A council of the tribe was then held on Barnesmore mountain, the result of which was a sanguinary irruption into Connaught, which they wasted as far as Galway and Limerick. O'Donnell next turned his arms to the assistance of Tyrone, who had risen in rebellion, and was present at the battle of the Blackwater. His confederates, Maguire and O'Rourke, soon after obtained an equally signal victory over Sir Conyers Clifford, the governor of Connaught, whom they met in a pass of the Carlow mountains on his way to lay siege to Belleek.

O'Donnell next invaded Thomond, which he laid waste; but he soon after returned to oppose Sir Henry Dockwra, governor of Loch Foyle [Londonderry], who had seized on his castle of Donegal in his absence, and had set up his cousin Neal Garv O'Donnell, who was in the queen's interest, as chieftain in his place. But the Spanish troops who had been sent by Philip II. to the assistance of the rebels, having landed at Kinsale [Kinsale] in the mean time (23rd of September, 1601), he was obliged to raise the siege of Donegal and march into Munster. Here having formed a junction with Tyrone (23rd of December), they attempted the relief of Kinsale, in which the Spanish auxiliaries were besieged by the lord deputy, but owing, it is said, to a dispute about precedence, their armies did not act in concert, and a total defeat was the consequence. O'Donnell then sailed for Spain, to solicit in person new succours from Philip. After spending a year and a half in fruitless negotiation, he was seized with fever and died at Valladolid, where he was interred with royal honours in the church of St. Francis. On the death of Hugh, Neal Garv having proved refractory, his cousin Rory O'Donnell was promoted to the chieftainship, and afterwards to the earldom of Tyrconnell, which produced an ineffectual rebellion on the part of Neal and his allies the Mac Swines; but on the 7th of May, 1607, a letter accusing Rory of having entered into a conspiracy with Tyrone, Maguire, O'Cahan, and other Irish lords, was dropped in the council-chamber at Dublin Castle, in consequence of which it was judged expedient for him to accompany the flight of his alleged associates, who immediately went beyond seas. In the mean time a town had been walled in at Derry by Sir Henry Dockwra, who had also built a castle at Lifford for the control of Tyrconnell. The vicinity of an English garrison proved so unsatisfactory to the proprietor of Inishowen, Sir Cahir O'Dogherty, that on some vague assurances of aid from Spain, communicated by the exiled earls, he broke into open revolt May 1st, 1608, and having surprised Culmore and put the garrison to the sword, advanced on Derry next day, which he carried with little resistance and burned to the ground. He then fell back on Kilmacrenan, and took up a strong position on the rock of Doune, where he held out for five months until he was killed by a Scotch settler, who shot him as he leaned over the edge of the rock. O'Dogherty being thus slain in rebellion and the exiled earls attainted of high treason, Donegal, along with five other counties of Ulster, escheated to the crown. On the plantation, the district about Lifford was allotted to English undertakers, of whom the chief were Sir Ralph Bingley and Sir John Kingsmill; the whole of Boylagh and Bannagh was allotted to John Murray, Esq., and his sub-patentees; the district of Portlough to Scottish undertakers, of whom the chief were Sir John Stewart and Sir James Cunningham; the district of Kilmacrenan to servitors and natives, of whom the chief were Sir William Stewart, Sir John Kingsmill, Sir George Marburie, Captain Henry Hart, Sir Mulmory Mac Swine, Mac Swine Banagh, Mac Swine Fanad, and Tirlagh Roe O'Boyle. In Inishowen, Muff was granted to the Grocers' Hall. Letterkenny owes its origin to Sir George Marburie, and Rathmelton to Sir William Stewart. At the time of the plantation the old Irish were in a very uncivilized state: in many of the precincts those who were permitted to remain, still practised their barbarous method of ploughing by the tail at the time of Pynnar's survey. During the wars that succeeded the rebellion of 1641, the British of the district along the Foyle, called the Laggan forces, did excellent service in this and the adjoining counties. There were some few forfeitures among the proprietors of Irish descent at the time of the Act of Settlement. The forfeitures consequent on the war of the revolution of 1688 did not extend into Donegal. The last historical event connected with this county was the capture of the French fleet off Tory Island by Sir John B. Warren in 1798.

The most remarkable piece of antiquity in Donegal is the Grianan of Aileach, the palace of the northern Irish kings from the most remote antiquity down to the twelfth century. It stands on a small mountain 802 feet in height, near the head of Loch Swilly. The summit of the mountain, which commands a noble prospect, is surrounded by three concentric ramparts of earth intermixed with uncemented stones. The approach by an antient paved road leads through these by a hollow way to a dun or stone fortress in the centre. This part of the work consists of a circular wall of Cyclopean architecture varying in breadth from 15 feet to 11 feet 6 inches, and at present about 6 feet high, enclosing an area of 77 feet 6 inches in diameter. The thickness of this wall is diminished at about 5 feet from the base by a terrace extending round the interior, from which there are flights of steps somewhat similar to those at Steague Fort, another remarkable Cyclopean erection in the county of Kerry. There was probably a succession of several such terraces before the upper part of the wall was demolished. Within the thickness of this wall, opening off the interior, are two galleries, 2 feet 2 inches wide at bottom and 1 foot 11 inches at top by 5 feet in height, which extend round one-half of the circumference on each side of the entrance doorway, with which however they do not communicate: their use has not been determined. The remains of a small oblong building of more recent date but of uncertain origin, occupy the centre. The space contained within the outer enclosure is about 5½ acres, within the the second, about 4; within the third, about 1; and within the central building, or cashel, ½. The stones of the wall are generally of about 2 feet in length, polygonal, not laid in courses, nor chiselled, and without cement of any kind.

The description is thus minute, as, from an antient Irish poem published in the first part of the 'Memoir of the Ordnance Survey of Ireland,' and which bears conclusive internal evidence of having been written before A.D. 1101, the building of Aileach ('the stone fortress') is attributed, with every appearance of accuracy, to Eochy Ollahir, whose reign is one of the very earliest historical epochs in Irish history. In this poem are preserved the names of the architects, the number of the ramparts, and the occasion of the undertaking. Until the publication of the Memoir, the uses and history of this remarkable edifice were totally unknown. It was reduced to its present state of ruin A. D. 1101, by Murtagh O'Brien, king of Munster, who, in revenge of the destruction of Kincora [Clare] by Donnell Mac Loughlin, king of Ulster, A. D. 1088, invaded this district and caused a stone of the demolished fortress of Aileach to be brought to Limerick for every sack of plunder carried home by his soldiery. This event was remembered as late as 1599, when the plunder of Thomond by Hugh O'Donnell was looked on as a just retaliation. On Tory Island also are some Cyclopean remains, not improbably connected with the very antient tradition of the glass tower mentioned by Nennius. Tory signifies the island of the tower. On the same island are also a round tower and the remains of seven churches and two stone crosses. Throughout the county are numerous memorials of St. Columba, or as he is more usually known in Ireland, St. Columbkille. This distinguished saint, the apostle of the Picts and founder of the church of Iona, was born at Gartan, a small village south of Kilmacrenan, where he founded an abbey which was afterwards richly endowed by the O'Donnells. Near Kilmacrenan is the rock of Doune, on which the O'Donnell was always inaugurated. The remains of the abbey of Donegal still possess interest for the antiquarian, and on the north of Glen Veagh are some very antient remains of churches. But by much the most celebrated ecclesiastical locality in this county is the Purgatory of St. Patrick, situated on an island in Loch Derg. The antient purgatory was in high repute during the middle ages: the penitont was supposed to pass through ordeals and undergo temptations similar to those ascribed to the Egyptian mysteries. (See O'Sullivan, *Hist. Cathol. Hib.*) In Rymer's 'Fœdera,' are extant several safe conducts granted by the kings of England to foreigners desirous of visiting Loch Derg during the fourteenth century. On Patrick's day, A. D. 1497, the cave and buildings on the island were demolished by order of Pope Alexander VI., but were soon after repaired: they were again razed by Sir James Balfour and Sir William Stewart, who were commissioned for that purpose by the Irish government A. D. 1632. At this time the establishment consisted of an abbot and forty friars, and the daily resort of pilgrims averaged four hundred and fifty. The cave was again opened in the time of James II., and again closed in 1780. At present the Purgatory, which has been a fourth time set up, but on an island at a greater distance from the shore than the two former, draws an immense concourse of the lower orders of Roman Catholics from all parts of Ireland, and many from Great Britain and America every year. The establishment consists, during the time of the station from the 1st of June to the 15th of August, of twenty-four priests: the pilgrims remain there six or nine days; the penances consist of prayer, maceration, fasting, and a vigil of twenty-four hours in a sort of vault called the 'prison.' The fees are 1*s.* 4½*d.* each, of which 6½*d.* is paid for the ferry. During the time the pilgrims remain on the island they are not permitted to eat anything but oaten bread and water. Water warmed in a large boiler on the island is given to those who are faint; this hot water is called 'wine,' and is supposed to possess many virtues. One of the pilgrims whom Mr. Inglis saw here, had her lips covered with blisters from the heat of the 'wine' she had drank. The number of pilgrims is variously estimated from 10,000 to 13,000 and 19,000 annually, and is at present on the increase. A station was advertised here in the year 1830 by a Roman Catholic bishop.

For the state of education in this county, see RAPHOE, with which diocese the county of Donegal is nearly coextensive.

The only newspaper published in this county is the Ballyshannon Herald; number of stamps used in 1835, 7185.

The county expenses are defrayed by Grand Jury presentments. The amount of direct taxation averages about 24,000*l.* per annum. Assizes are held twice a year at Lifford, where there is a county gaol: there are bridewells at Donegal and Letterkenny. The district lunatic asylum is at Londonderry. The share of the expense of erecting this establishment, which falls on Donegal, is 9055*l.* 10*s.* 1*d.*

(*Statistical Survey of Donegal*, 1802; *Sketches in Ireland*, by the Rev. C. Otway; *Northern Tourist;* Inglis's *Ireland in* 1834; *Memoirs of Ordnance Survey of Ireland*, Hodges and Smith, *Dublin*, 1837; *Parliamentary Papers, &c.*)

DONGOLA, a province of Upper Nubia, extending southwards from the borders of Mahass about 19° 30′ N. lat., along the banks of the Nile as far as Korti, about 18° N. lat., where it borders on the country of the Sheygia Arabs. The Nile coming from Sennaar flows in a northern direction through Halfay, Shendy, and the Barabra country to about 19° N. lat. and 33° E. long., when it suddenly turns to the south or south-south-west, passing through the Sheygia country. [BARKAL.] After passing below the rock of Barkal, as it reaches the town or village of Korti, its course assumes a direction nearly due west, which it continues for about 20 or 30 miles, and then resumes its north direction towards Egypt. The province called Dongola stretches along the banks of the river from Korti first to the westward, and then northwards, following the bend of the stream to below the island of Argo, where it borders on Dar-Mahass, which last is a distinct province of Nubia. The whole length of Dongola is about 150 miles, and its breadth may be considered as extending no further than the strip of cultivable land on each bank, which varies from one to three miles in breadth, beyond which is the desert. The left or west bank is the more fertile, the eastern being in most places barren, and the sands of the desert stretching close to the water's edge. (Waddington and Hanbury's *Travels*.) The fine and fertile island of Argo is included within the limits of Dongola. The principal place in Dongola is Maragga or New Dongola, on the left or west bank, in 19° 9′ N. lat., which was in great measure built by the Mamelukes during their possession of the country from 1812 to 1820, when they were driven away by Ismail, son of the pasha of Egypt. (Caillaud's *Travels*.) Further south and on the right bank of the Nile, is Dongola Agous or Old Dongola, formerly a considerable town, but now reduced to about 300 inhabitants. At one end of it is a large square building, two stories high, which was formerly a convent of Coptic monks, and the chapel of which has been turned into a mosque. There are also other remains of Christian monuments, for Dongola was a Christian country till the fourteenth century, and Ibn Batuta speaks of it as such. Makrizi in the fifteenth century describes Dongola as a fertile and rich country with many towns; and Poncet, who in 1698 visited Old Dongola and its king and court, speaks of it as a considerable place. The king was hereditary, and paid tribute to the king of Sennaar. After Poncet's time, however, the Sheygia Arabs desolated Dongola, and reduced it to subjection during a great part of the last century, a circumstance which accounts for the present depopulated and poor state of the country. When the Mamelukes who had escaped from Egypt came to Dongola in 1812, the country was under several Meleks or petty native chiefs, subject however to the Sheygia Arabs. It is now a Beylik dependent on the pasha of Egypt; and the bey of Dongola, who resides at Maragga, extends his jurisdiction also over the country of the Sheygia Arabs. The natives of Dongola resemble those of Lower Nubia in appearance, they are black, but not negroes; they produce dourra, barley, beans, and have sheep, goats, and some large cattle. The fine horses which in Egypt are known by the name of Dongola come chiefly from the Sheygia or Barabra countries. The houses are built of unbaked bricks, made of clay and chopped straw. The country of Dongola is more fertile than Lower Nubia, but the people are few and indolent or dispirited by long calamities. Rüppel, in his 'Travels to Nubia and Kordofan,' gives particulars of the manners and habits of the people of Dongola.

DONNE, JOHN, was born at London in the year 1573 of respectable parents. At the early age of eleven, being esteemed a good Latin and French scholar, he was sent to the University of Oxford, and after remaining there a few years was removed to Cambridge. Although he greatly distinguished himself in his studies he took no degree, as his family being Catholic had conscientious objections to his making the requisite oath. At the age of seventeen he went to Lincoln's Inn to study the law; and while here, in order to satisfy certain religious doubts, he read the controversies between the Roman Catholics and Protestants, and decided in favour of the latter. After travelling for about a year in Spain and Italy, he became on his return secretary to Lord Elsinore, and fell in love with that nobleman's niece, the daughter of Sir George More. The lady returned his affection, and they were privately married. When this union was discovered by Sir George, he was so indignant, that he induced Lord Elsinore to dismiss Donne from his service. The unfortunate secretary was afterwards imprisoned by his father-in-law, and his wife was taken from him; but by an expensive law-proceeding, which consumed nearly all his property, he was enabled to recover her. Sir George forgave him shortly afterwards, but absolutely refused to contribute anything towards his support, and he was forced to live with his kinsman, Sir Francis Whalley. Dr. Morton, afterwards bishop of Gloucester, advised Donne to enter into the Church, and offered him a benefice; but although in great poverty he refused the offer, thinking himself not holy enough for the priesthood. Sir Francis Whalley at last effected a complete reconciliation between Donne and Sir George, who allowed his son-in-law 800*l.*, in quarterly sums of 20*l.* each, till the whole should be paid. Still he continued to be in embarrassed circumstances, and after residing some time at Mitcham, whither he had removed for the sake of his wife's health, he lived in the house of Sir Robert Drury at Drury Lane. He accompanied that gentleman to Paris, contrary to the solicitations of his wife, who could not bear to be parted from him, and who, as she said, felt a foreboding of some evil. While Donne was in Paris, there is a story that he saw the apparition of his wife enter his apartment bearing a dead child, and shortly afterwards received the intelligence that his wife had actually been delivered of a dead child at that very moment. The honest angler, Isaac Walton, who writes Donne's Biography, seems inclined to believe this story. On Donne's return to England he was introduced to James I., and delighted the king by a polemic treatise against Catholicism, entitled 'Pseudo-Martyr.' James was so anxious that he should take holy orders, that Donne at length complied, and became the king's chaplain-in-ordinary. His style of preaching is thus described by Walton: 'always preaching as an angel *from* a cloud, but not *in* a cloud.' The University of Cambridge made him doctor of divinity; and now, just as he was rising from his misfortunes, his happiness was embittered by the death of his beloved wife. The benchers of Lincoln's Inn presented him with their lectureship; and after accompanying an embassy to the queen of Bohemia, James's daughter, he became dean of St. Paul's and vicar of St. Dunstan's, being then in the fifty-fourth year of his age. Falling into a consumption, he was unable to perform his clerical duties; but some enemy having hinted that he merely feigned illness because he was too idle to preach, he mounted his pulpit, and almost in a dying state, preached what Walton has called his 'own funeral sermon.' This discourse was afterwards printed under the quaint title of 'Death's Duel.' From this time he abandoned all thoughts of life, and even had a portrait painted of himself, enveloped in a shroud, which he kept in his bed-room. Shortly afterwards he died, having exalted himself (according to Walton), almost to a state of angelic beatitude.

Of the real goodness and piety of Donne there can be no doubt. But while we admire these genuine qualities, we must not be blind to the superstitions and puerilities which were blended with Donne's religion, though these might be attributed partially (but not wholly) to the age. There was evidently a great deal of simplicity about him, as well as about his biographer Walton, who, enthusiastic in his admiration, exalts a weakness as much as his hero's most brilliant qualities. However, to those who wish to see characters like Donne treated in the spirit of their own time, we cannot recommend a more delightful book than Walton's Life of Donne.

As a poet, Donne was one of those writers whom Johnson has (to use Wordsworth's expression) 'strangely' designated metaphysical poets: a more infelicitous expression could not well have been devised.

In the biography of Cowley, Johnson has committed an unintentional injustice towards Donne. By representing Cowley's faults as the faults of a school, he brings forward parallel passages from other authors containing like faults, and Donne is one of them. He has previously described the school as a set of cold unfeeling pedants, and hence the reader finding Donne's worst lines cited in illustration of that remark, may easily imagine that he never did anything better, and set him down as a mere pedantic rhymer.

The fact is, that 'quaint conceits' are only the deformities of Donne's poetical spirit: the man himself had a rich vein of poetry, which was rarely concealed even when most laboriously encumbered, while some of his pieces, both for thought and even melody, are absolute gems. His fault, far from being coldness, is too much erotic fervour: he allows his imagination to run loose into the most prurient expressions; and in some of his amatory pieces, the conceits stand as a corrective to their excessive warmth. His satires, though written in a measure inconceivably harsh, are models of strength and energy. Their merits were discovered by Pope, who (to use his own odd phrase) translated them into English.

Donne's principal theological works, besides sermons, are the 'Pseudo-Martyr,' and a treatise against suicide, called 'Bia-thanatos.'

We beg leave to call the attention of those readers who study the progress of their own language to one fact, and that is, that whilst many of the pieces of Donne, written in lyric measures, are absolute music, what he has composed in the heroic measure is painfully uncouth and barbarous. Thus, though the invention of heroic verse took place at an early period (it is attributed to Chaucer), we find that a language must be in a highly cultivated state before this kind of verse can be written in perfection.

DOOM or DOUM, a remarkable palm-tree exclusively inhabiting Upper Egypt, especially the neighbourhood of Thebes, whence it is named Cucifera Thebaica. Its stem, instead of growing without branches like other palms, forks two or three times, thus assuming the appearance of a Pandanus. Clumps of it occur near Thebes; the fruit is about the size of an orange, angular, irregularly formed, of a reddish colour, and has a spongy, tasteless, but nutritious rind. The albumen of the seed is hard and semitransparent, and is turned into beads and other little ornaments. Gætrner described it under the name of Hyphæne coriacea.

DOOMS, FALSING OF, a term of the old Scots law, somewhat similar in import with appeal of false doom in the law of England. A doom or judgment thus falsed or charged with injustice, was of old taken from the bailies of burghs to the court of Four-boroughs, and from the court baron or freeholder's court to the court of the sheriff, thence to the justice ayre, and thence to the parliament. But on the institution of the court of session, in 1532, a new method of review was established, the proceedings of the inferior courts being thenceforward carried into the court of session by advocation, suspension, and reduction, a form of process derived from the tribunals of modern Rome, and from the court of session to parliament by protest for remeid of law, and now to the House of Lords by appeal.

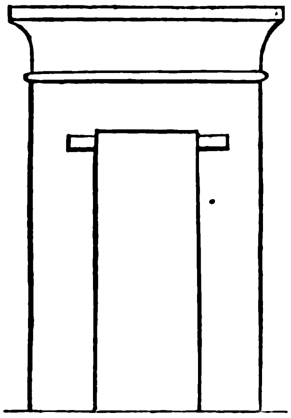
The civil jurisdiction of the court of justiciary declined immediately on the institution of the court of session. By the Jurisdiction Act, however, 20 Geo. II., a power of appeal to a limited extent was again bestowed on the circuit court of justiciary, and a process of appeal laid down entirely in the spirit of the antient falsing of dooms. This method of appeal has, with some slight alterations, been continued to the present time.

For the old falsing of dooms, see *Stat. Will.* c. 10; 1429, c. 116; 1471, c. 41; 1503, c. 95, 99.

DOONGURPORE, a small principality, situated in the district of Bagur and province of Gujerat, in a hilly tract, as to which but few particulars are known. This principality was formerly united to Odeypore, in Rajpootana, and the rajah of Doongurpore still claims seniority over the reigning sovereign of Odeypore, but this distinction is merely nominal, and there is in fact no political connexion between the two rajahs. The greater part of the inhabitants of Doongurpore are Bheels, who are considered to be the Aborigines of the country. Some years ago the rajah to preserve his authority, which was threatened by the more powerful among his subjects, took some bands of Sindes into his pay, but they soon usurped all power, and were proving destructive to the country, when the rajah sought and obtained the protection of the English under whose intervention the country has recovered from the desolate condition to which it had been reduced. The town of Doongurpore, the capital, is situated in 23° 54′ N. lat. and 73° 50′ E. long.: about 95 miles north-east from Ahmedabad. A lake near this town is said to have its mounds constructed with solid blocks of marble.

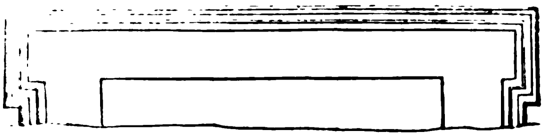
DOOR and DOORWAY, the entrance leading into a public or private edifice, and the opening or entrance way into an apartment or from one apartment to another. This way is closed with the door, which is generally made of wood, and hung to one of the sides or jambs of the doorway. The name door is from the Saxon part of our language, but it is one of those roots which occur also in the cognate languages, as the Greek and Latin. The doorway consists of a sill, or horizontal piece laid on the ground, the perpendicular pieces, architraves or jambs, called also by Vitruvius the antepagmenta, and the lintel, or piece laid on the top of the jambs. According to Vitruvius (iv. 4), who gives general rules for the proportions of the portals of temples, the hypothyron, or aperture for doors, should be as follows:—The height from the pavement to the ceiling of the temple being divided into three parts and a half, two of the whole parts were allowed for the height of the door. These two parts were subdivided into twelve smaller parts, of which five and a half were allowed as the width of the door at the base; and the upper part was contracted according to the following rules: if not more than 16 feet high, the contraction was one-third of the width of the jamb on the face; if the height was more than 16, and not exceeding 25 feet, a fourth part of the width of the jamb only was employed; and from beyond 25 feet, and not exceeding 30 feet one-eighth only. Doors higher in proportion were made perpendicular.

The Egyptian doorway is perpendicular, and consists of two flat architraves of stone, with a flat lintel surmounted by an astragal moulding, above which is a frieze terminated with a bold cavetto and fillet. The doorway inclosed between the architraves and lintel is narrow in its proportions. The form of the door itself (if there ever was one used) is unknown.



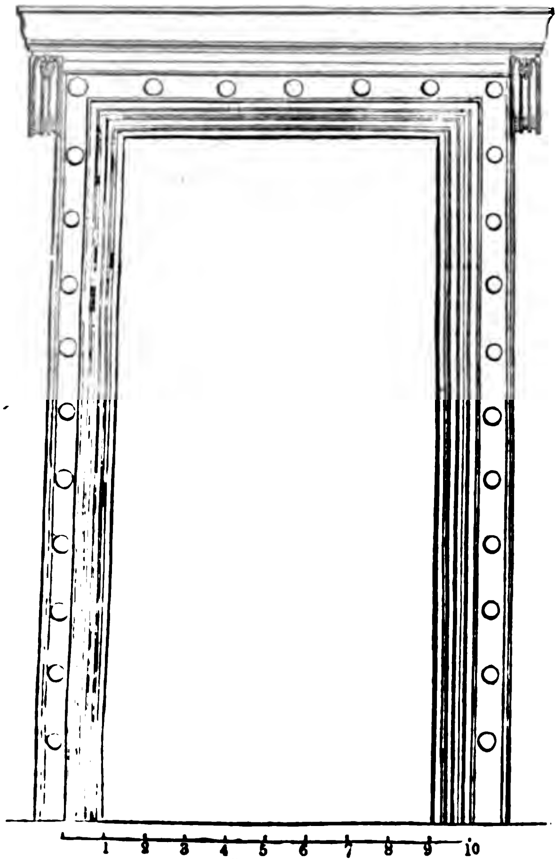
Egyptian Door from Denderah.

The Greek doorway is often inclined inwards, or contracted at the top; it has also a peculiar lintel or top-stone, with mouldings running round it and meeting the ends of the architraves, and forming two elbows, thus:



Greek lintel head, showing the manner in which the architrave moulding is formed round it.

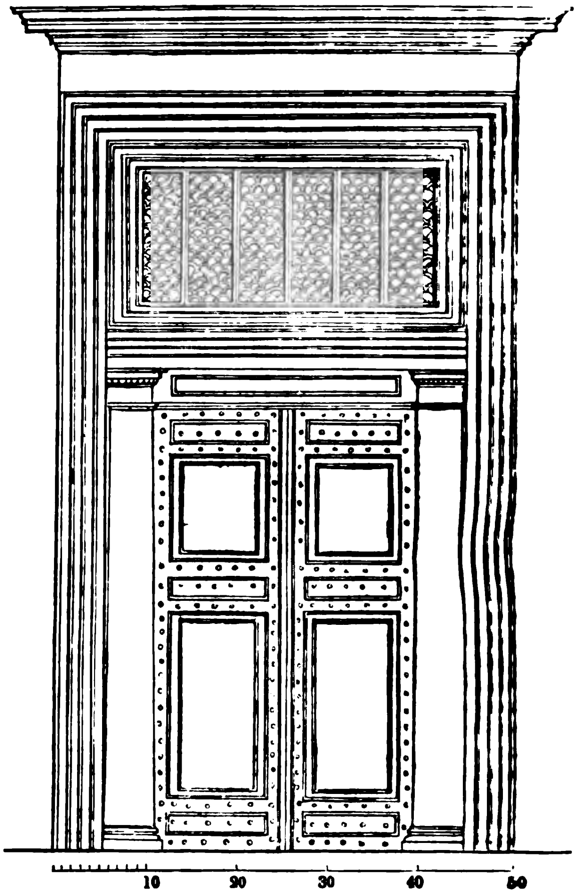
The mouldings of the architraves are delicately formed, and decorated with ornaments, and a frieze and cornice supported on consoles are sometimes added. The decorations of the Erectheium doorway are very rich, but the size of our cut precludes the possibility of giving them. We have no example of the form and construction of a Greek door.



Scale of Feet.

Greek Doorway of the Erectheium; from Donaldson's work on Doors.

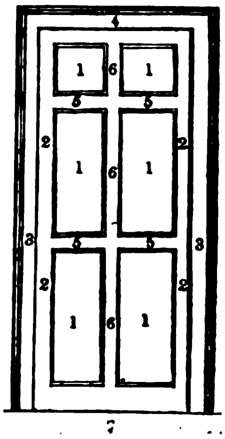
The Roman doorway is formed on the model of the Greek, except that the elbows or projections of the architrave mouldings over the lintels are of rare occurrence, as well as the inclination of the jambs or their contraction at the tops: they occur however in the temple of Vesta at Tivoli, and of Hercules at Cora. The bronze door of the Pantheon at Rome, of which we have given a cut, is not we believe altogether an antique model. The bronze door of the temple of Romulus at Rome is however an antique door. (Donaldson *on Doors*, plates.) Some notion of the construction and panelling of antient doors may be derived from the above work. Many beautiful models of modern doorways exist at Rome, and in various cities of Italy. A careful study of them cannot fail to improve the taste of the architect. The modern bronze doors of the Baptistery at Florence and St. Peter's at Rome are unrivalled for their size, design, and beauty of workmanship.



Scale of Feet.

Pantheon Door and Doorway; from Donaldson's work on Doors.

Wooden-framed doors, either single or double, consist of styles or upright side pieces, rails or horizontal pieces tenoned into the styles, and panels or thinner pieces of



Common framed Door. 1, 1, 1, 1, panels; 2, 2, styles; 3, 3, architrave, or jambs; 4, lintel; 5, 5, rails; 6, 6, 6, munnions; 7, sill.

panel let into grooves in the compartments formed by the joining the rails and styles together. Muntons, a corruption of mullions, are short upright pieces let into the rails. The panels have often a moulding running round their edges, either on one or both sides. For the technical terms of framed doors, the reader may consult Nicholson's Dictionary; and for the best general information on doors, the recent work of T. L. Donaldson on Doors.

DOOR, GOTHIC. [GOTHIC ARCHITECTURE.]

DOORNIK. [TOURNAY.]

DORA'DO (constellation), the sword-fish, a constellation of Bayer, situated in the southern hemisphere, and cut nearly in half by a line joining α Argûs and α Eridani. The principal stars are as follows:—

Character.	No. in Catalogue of		Magnitude.
	La Caille.	Astron. Society.	
γ	327	523	4
α	356	535	3
ζ	392	610	6
β	436	627	4
δ	488	730	6
ε	469	731	5

DORAT, CLAUDE JOSEPH, was born at Paris in the year 1734. Having a considerable fortune he devoted himself entirely to poetry, and produced a number of tragedies, which, though some were successful, drew on him torrents of ridicule from contemporary wits. He seems however to have attained some reputation as a writer of the lighter class of poems. He had a great passion for bringing out splendid editions of his own works, and the cost of vignettes and tail pieces consumed his fortune. He died in the year 1780.

The works of Dorat fill twenty volumes, but they are not highly estimated. La Harpe will scarcely allow him mediocrity. *La Déclamation Théâtrale*, a work on the proper department of actors, is considered his chef d'œuvre; but, though it is replete with wholesome advice to performers, it is deficient in everything that can be called poetry. His lighter tales in verse are told with naiveté and humour; of these *Alphonse* enjoys the best reputation, but they are terribly indecent. His dramas are entirely forgotten.

It should be observed that the edition of the works of Dorat in twenty volumes is adorned with engravings superior to most works of the time; and though we may blame the author for his prodigality in lavishing his fortune on such ornaments, we must not refuse the praise which is due to his taste, considering that these choice engravings were made at his own suggestion.

DORCHESTER, a borough and market-town, having separate jurisdiction, in the division of Dorchester and county of Dorset, 120 miles south-west by west from London.

Dorchester was called by the Romans 'Durnovaria,' and 'Durinum.' Hutchins, in his history of Dorsetshire, says that the first part of the name Dorchester is from Dor, or Dwr, in antient British, *water*, which seems the best opinion. By the Saxons it was called 'Dorceaster,' from whence we have the modern name Dorchester. It has also been called 'Villa Regalis,' to distinguish it from Dorchester in Oxfordshire, called 'Villa Episcopalis.'

Placed on the 'Via Iceana' (the Icknield street), it must have been a place of some importance in the time of the Saxons, as two mints were established here by King Athelstan. The town was nearly destroyed by fire in 1613; 300 houses and the churches of the Holy Trinity and All Saints, were totally consumed; and the loss was estimated by Hutchins at the enormous sum of 200,000*l.*

Many severe battles were fought in the vicinity of Dorchester between the king's and the parliamentary forces during the civil war. At the assizes held here on the 3rd of September, 1685, by Judge Jefferies and four other judges, out of 30 persons tried on a charge of being implicated in Monmouth's rebellion, 29 were found guilty and sentenced to death. The following day 292 persons pleaded guilty, and 80 were ordered for execution. John Tutchin, who wrote the 'Observator' in Queen Anne's time, was sentenced to be whipped in every town in the county once a year, but on his petitioning to be hanged as a *mitigation* of his punishment, he was reprieved, and subsequently pardoned.

The manor of Dorchester has passed through the hands of a great many families, and in the 11th year of the reign of King Henry IV. appears to have been the king's demesne borough. In the 1st of Henry V. the profits of the borough were confirmed to the burgesses at a fee farm rent of 20*l.* The rent was subsequently granted, and is now paid, to the Hardwicke family.

The corporation claim a prescriptive right, but they have charters of Edward III., Charles I., and of other reigns; the governing charter is that of the 4th Charles I. The assizes and courts of quarter sessions for the county and for the borough are held here, as well as a court of record and a court leet. A high steward is appointed for life.

The borough has returned two members to parliament since the 23rd year of the reign of King Edward I., but, by the Boundary Act, the boundaries are considerably extended, and include Fordington, Colliton Row, and part of Trinity parish, and include a population of 4930 inhabitants. The population of the town itself is 3033, of whom 1552 are females.

The town of Dorchester is pleasantly situated on a slight elevation near the river Frome, and consists principally of three spacious streets, which are well paved and lighted. A delightful walk, well shaded, surrounds two-thirds of the town. Races are annually held here in September; and a theatre was erected in 1828. The shire hall is a plain building of Portland stone, and is commodiously fitted up. The gaol, built in 1793, contains the county gaol, the house of correction, and the penitentiary: the interior is divided into four wings, communicating by cast-iron bridges.

The trade is now very trifling, but in the reigns of King Charles I. and James I. the manufacturing of cloth was carried on to some extent; the market-days are Saturday and Wednesday. There are fairs on Trinity Monday, St. John the Baptist's, and on St. James's days; the three last are principally for sheep and lambs, for which Dorchester is celebrated. A tract of land, called Fordington Field, partly meadow, partly arable, surrounds a portion of the town: its soil is particularly adapted for the feeding of cattle, and it extends over a surface seven miles in circumference, without any inclosures.

The town is divided into three parishes, All Saints (commonly called All Hallows), St. Peters, and the Holy Trinity, and is in the archdeaconry of Dorset and diocese of Bristol. St. Peter's church contains some curious monuments, is spacious, well built, and consists of a chancel, nave, aisles, and an embattled tower, 90 feet in height. The living of Trinity is by far the best, being now worth 400*l.* a year. There are also places of worship for Baptists, Independents, Wesleyan Methodists, and Unitarians.

A free grammar-school was founded and endowed by Mr. Thomas Hardy in the year 1579, the government of which is vested in trustees. It has two exhibitions, of 10*l.* per annum, to St. John's College, Cambridge, and one of 5*l.* per annum to any college of either University. A second school, founded prior to the grammar-school, was refounded in 1623 by the corporation, the master of which instructs five boys gratuitously in reading, writing, and arithmetic. There are almshouses, founded by Sir Robert Napier in 1615, by Matthew Chubb in 1619; and the Whetstone almshouses, for the support of four couples, or four single persons.

The town was strongly fortified and entirely surrounded by a wall, when in possession of the Romans; and the site where an antient castle stood is still called Castle Green. The building itself was totally demolished, and a priory for Franciscan monks was constructed out of the materials by one of the Chideok family, in the reign of Edward III., near the site of the old castle. The church of the priory was pulled down at the Reformation, and the house became the residence of Sir Francis Ashley, and was subsequently converted into a Presbyterian meeting-house.

Tesselated pavements, Roman urns, and a quantity of coins of Antoninus Pius, Vespasian, Constantine, and other Roman emperors, have been dug up in the vicinity of Dorchester.

DORDOGNE, a river in the south of France, rises in the department of Puy de Dôme, on the slope of Mont

Dor, the summit of which (Puy de Sancy, 6224 feet high) is the highest point of central France. The Dordogne flows past the towns of Bort, Argentat, and Beaulieu, all in the department of Corrèze, to the junction of the Cére.

From the junction of the Cére the course of the Dordogne is westward: at Mayronne, 14 miles below the junction, the navigation commences; and at Limeuil, about 40 miles below Mayronne, the Dordogne receives the Vezère, a navigable tributary, which rises in the department of Corrèze, and has a south-western course of about 100 miles. [CORREZE.] At Libourne, 70 miles below the junction of the Vezère, the Dordogne receives the Isle, its largest tributary, which rises in the department of Vienne, and has a south-west course of nearly 120 miles. About 22 miles below the junction of the Isle, the Dordogne unites with the Garonne, and forms the æstuary of the Gironde. Its whole length is about 240 to 250 miles, for more than 130 of which it is navigable. The tide flows up to Castillon, nearly 50 miles above its junction with the Garonne: and sometimes at spring tides, when the water in the river is low, sets in with a violence which overwhelms everything. The anchors of the boats and vessels moored in the stream are carried away, the cables broken, and the vessels wrecked, unless the owners have taken the precaution to place them in the middle of the channel, where the depth of the water diminishes the violence of the stream. This violent flow of the tide is called *Le Mascaret*; the noise which it makes may be heard as far off as seven or eight miles. [BORE.]

The Dordogne is noticed in the writings of Ausonius and Sidonius Apollinaris, in the 4th and 5th centuries under the name of Duranius. Gregory of Tours, in the 6th century, calls it Dorononia; and Eginhard (9th century) Durancia. Dordonia, the Latinized form of Dordogne, first appears in the writings of Aymoin or Aimoin in the end of the 10th or beginning of the 11th century.

DORDOGNE, a department in the south of France, taking its name from the river just described. Its figure approximates to that of an equilateral triangle, having its sides respectively facing the S., N.E. and N.W. It is bounded on the N. and N.E. by the department of Haute Vienne: on the E. by that of Corrèze: on the S.E. by that of Lot: on the S. by that of Lot and Garonne: on the S.W. by that of Gironde: on the W. (for a very short distance) by that of Charente Inférieure: and on the N.W. by that of Charente. Its greatest length from N. to S. is about 80 miles, and its greatest breadth from E. to W. about 72 miles. The area of the department, according to M. Malte Brun, is 3640 square miles: rather more than the joint area of the English counties of Norfolk and Suffolk: the population in 1832 was [illegible] (not more than 12-17ths of the population of the two English counties just mentioned), giving 133 inhabitants to a square mile. Perigueux, the capital, on the Isle, (population in 1832, 8700 for the town, or 8956 for the whole commune,) is about 264 miles in a straight line S.S.W. of Paris, or 294 miles by the road through Orléans, Vierzon, Châteauroux, and Limoges.

There are no very lofty hills in this department. The hills which run N.W. from the mountains of Auvergne send off a subordinate chain which just crosses the northern part of the department near Nontron. Other hills of lower elevation traverse the department, and form, except in the instance of the two great rivers, the Dordogne and the Isle, narrow valleys, which are liable to be inundated and damaged by the floods. The department is watered by the Dordogne, which passes through it from E. to W.: and is navigable throughout this part of its course. The Vezère enters the department from that of Corrèze, and flows past Montignac, where it becomes navigable, into the Dordogne. The Isle arises in the department of Haute Vienne, and entering that of Dordogne on the N.E., flows through it in a S.W. direction, until it enters the department of Gironde a few miles above its junction with the Dordogne. The Dronne rises in the department of Haute Vienne, and entering that of Dordogne, flows through it or along the border until it enters the department of Gironde, and unites with the Isle. These are the principal rivers. Of the smaller ones, the Nizonne, which receives the Belle and the Pude, falls into the Dronne; as do also the Boulou and the Colle: the Loue, the Haute Vezère (which rises in the department of Corrèze), the Vern, the Salembre, and the Grande Durette, fall into the Isle: the Beune falls into the Vezère; and the Melve, the Ceou, the Couze, the Coudou united with the Louue, into the Dordogne: the Bandiat, in the northern part of the department, belongs to the basin of the Charente, and the Dropt and the Allemance, in the southern part, to that of the Garonne.

'The soil is far from productive: the calcareous rock often presents its bare surface, or is covered only with heath, broom, and chestnut-trees, which occupy immense tracts. Sometimes the continuity of these arid lands is broken only by the intervention of marshes. Rich and fertile spots occur, as it were, accidentally in the midst of this district. The grain harvests would be insufficient for the support of the inhabitants, were they not eked out by the use of chestnuts as food: but of the produce of the vineyards more than half is sold as wine or converted into brandy for exportation. The mineral wealth of the department is considerable: it consists of pit coal, manganese, and several other articles, especially iron. But that which entitles this department to the consideration of epicures is the white wine of Bergerac, the delicacy of the pork, the abundance of red partridges, the excellent pike which are found in the ponds, the liqueurs, the fine confectionary of Perigueux, and, above all, the truffles which the district round that town affords.' (Malte Brun.)

The department contains 635 communes, and is divided into five arrondissements or sub-prefectures, viz., Perigueux, central (101,527 inhabitants); Nontron, in the north (82,1[illegible] inhabitants); Bergerac, in the south (116,897 inhabitants); Sarlat, in the east (109,430 inhabitants); and Riberac, in the west (72,774 inhabitants). Of the towns, Perigueux and Bergerac on the Dordogne (population, 5966 for the town, 8557 for the whole commune,) are described in their respective articles.

Sarlat is between the Dordogne and the Vezère, on a brook which flows into the former and in a deep valley. The neighbourhood abounds with copper and iron mines, coal-pits, and mill-stone quarries. The population of Sarlat in 1832 was 3917 for the town, or 6056 for the whole commune. The inhabitants are engaged in making paper. Though it is so small a place, Sarlat was before the Revolution a bishop's see. The bishop was a suffragan of the archbishop of Bordeaux. Sarlat was one of the strongholds of the Huguenots, and was twice besieged in the religious wars of the sixteenth century.

Riberac is on the left or south bank of the Dronne in a fertile plain, in which corn and hemp are grown, and sent to Bordeaux. There are at Riberac the remains of a strong castle, once belonging to the viscounts of Turenne. The population of the whole commune in 1832 was 39[illegible]; that of the town is not distinguished. Riberac is not on or near any main road.

Nontron is on the Bandiat, in the northern part of the department. The inhabitants amounted in 1832 to [illegible] for the town, or 3246 for the whole commune. They manufacture leather and common cutlery, and carry on trade in the iron produced by the mines and wrought in the forges of the surrounding country.

Beside the above, which are the capitals of arrondissements, there are in the north, St. Jean-de-Colle, on the river Colle; Mareuil and Thiviers, on the Belle; and La Roche-Beaucour, on the Nizonne. The last is on the road from Paris to Perigueux, 20 or 21 miles from the latter, and consists of one crooked, steep and ill-paved street, with ill-built houses. The situation however is pleasant. The inhabitants are given by Vaysse de Villiers (A. D. 181[illegible]) at 1500. Many sheep, whose flesh is in good esteem, are fed in the neighbourhood. In the eastern part there are Excideuil, near the Loue, Terrasson and Montignac on the Vezère, and St. Cyprien on the Dordogne. Montignac had in 1832 a population of 2629 for the town, and 3922 for the whole commune: the navigation of the Vezère begins here. Terrasson is on the road from Perigueux to Brives and Tulle. St. Cyprien had in 1832 a population of 1541 for the town, or 2375 for the whole commune.

In the western part are St. Aulaye and La Roche-Chalais or Chalars, on the Dronne, and La Tour Blanche, near the source of the Pude; and Villefranche-de-Louchapt, between the Isle and the Dordogne: these are all very small places. In the south are Eymet, on the Dropt; Beaumont, on the Couze; Issigeac, Belvès, Biron, Monpazier, and another Villefranche. Belvès had in 1832, a population of [illegible] for the town, or 2563 for the whole commune. A considerable quantity of nut-oil is made here. Biron was a barony held by the Maréchal de Biron, one of the chief supporters of Henry IV., and was made a duchy in favour of the son of the Maréchal, who was afterwards beheaded for a conspiracy against Henri.

In the centre of the department are Brantôme and Bourdeilles, on the Dronne; St. Astier, on the Isle; and La Linde, on the Dordogne. Brantôme has a population of nearly 3000. According to the 'Dictionnaire Universelle de la France' (A.D. 1804), the manufactures of Brantôme were serges, hosiery, and cotton and woollen yarn. There was at this place a Benedictine abbey, founded by Charlemagne, A.D. 769. This abbey was held in commendam by Pierre de Bourdeilles, author of the well-known 'Mémoires de Brantôme.' The town of Bourdeilles is said by Expilly to have an antient castle. The inhabitants of the town were, according to the 'Dictionnaire Universelle,' engaged in weaving serges and other light woollens, and cotton hose.

Not far from the bourg or small town of Miremont, near the Vezère, is a cavern whose ramifications extend for about five miles. Another cavern, that of Mussidan, in the west of the department, is remarkable for the fountain of Sourzac, which gushes from it and forms a cascade.

For ecclesiastical purposes, the department forms the diocese of Périgueux, the bishop of which is a suffragan of the archbishop of Bordeaux: for the administration of justice, it is included in the jurisdiction of the Cour Royale of Bordeaux; and for military affairs it is comprehended in the eleventh division, of which the head-quarters are at Bordeaux. It sends seven members to the Chamber of Deputies. (Malte Brun; Balbi; Vaysse de Villiers.)

In respect of education, this department is rather behind the average of France. M. Dupin assigns to it, in the chart subjoined to his 'Forces Productives, &c. de la France' (Paris, A.D. 1827), one male child at school to every 104 inhabitants.

DORDRECHT. [DORT.]

DO'RIA, ANDRE'A, was born in 1466 at Oneglia, in the western Riviera of Genoa, of an antient noble family, to which Oneglia belonged as an imperial fief. Having lost his parents at an early age, Doria embraced the profession of arms, served under several princes in various parts of Italy, and lastly entered the service of Francis I., who made him commander of his fleet in the Mediterranean. Genoa had been for a long time distracted by factions, which had brought it under the dominion or protection, as it was styled, of the Visconti and Sforza, dukes of Milan. The French having conquered the duchy of Milan, placed a garrison in Genoa, upon condition of respecting the liberties of the citizens, a promise which they kept with the usual faith of conquerors. The citizens were oppressed in various ways, and Doria having remonstrated with the agents of Francis in behalf of his countrymen, a secret order came for his arrest, just after his nephew and lieutenant, Filippino Doria, had gained an important victory for the French over the imperial fleet near the coast of Naples in 1528. The French were then besieging Naples by land. Barbezieux, a French naval officer, was sent to Genoa with twelve galleys to seize on the person of Andrea Doria, who, having had intimation of this design, retired into the gulf of La Spezia, sent for his nephew to join him with the galleys which he had fitted out at his own expense, and offered his services to Charles V., who received him with open arms. Doria stipulated with Charles that Genoa, as soon as it was freed from the French, should be restored to its independence under the imperial protection, but no foreign garrison or government should be admitted into it. At the same time he engaged to serve the emperor with twelve galleys, fitted out by himself, which number was afterwards raised to fifteen, for which Charles agreed to pay him 60,000 ducats a year. Doria soon after appeared before Genoa with his little squadron, and being favoured by the inhabitants, he obtained possession of the city, and drove the French away. It is said that Charles offered him the sovereignty of Genoa; but Doria preferred a nobler course. He re-organised the government of the republic, and, in order to extinguish the factions, he named a certain number of families of nobles and citizens, out of which the legislative council was to be chosen annually. New families might be added to the number from time to time. A Signoria, or Council of Sixteen, with a Doge, renewed every two years, composed the executive, and five censors were appointed for five years as guardians of the laws. Doria was appointed censor for life, with the title of 'Father and Liberator of his country.' He now resumed his naval career as admiral of Charles V., and distinguished himself against the Turks and the Barbary pirates. He escorted Charles V. to the expedition of Tunis in 1535, and contributed greatly to the taking of the place. In 1538 he joined the Venetian fleet off Corfu, when he lost the opportunity of attacking, with every chance of success, the Turkish armament commanded by the famous Barbarossa. [BARBAROSSA; KHAIR EDDIN.] His conduct on the occasion was attributed to secret instructions from the emperor. In 1541 Doria commanded the fleet in the expedition of Charles V. against Algiers, from which he is said to have tried in vain to dissuade the emperor. It turned out as he had foreseen, and he could only save the emperor with a small part of the army. In his old age, Doria retired to Genoa, where he lived in great splendour and reputation, the first among his fellow-citizens, respected by all, and consulted upon all matters of importance. Charles V. created him Prince of Melfi and Tarsi in the kingdom of Naples. At the beginning of 1547 his life was threatened by the conspiracy of Fieschi: his nephew Giannettino was murdered, but Andrea escaped, and Fieschi perished in the attempt. A few months after a fresh conspiracy was formed against him by Giulio Cibo, a Genoese emigrant, who however was discovered and executed. In 1548 some of the ministers of the emperor proposed to build a fortress, and introduce a Spanish garrison, in Genoa, under the pretence of preventing any new conspiracies, but the Genoese appealed to Doria, who interposed and prevented the execution of the project. In 1552 Doria, then eighty-five years old, went to sea again, to attack his old enemies the Turks, who, under Dragut Reis, were ravaging the coast of Naples. Doria lost some of his galleys, which were surprised by the Turks, but Dragut sailed away for the Levant. In 1556 he resigned his command to his nephew, Gian Andrea Doria, who was confirmed as admiral by Philip II. Andrea Doria died in his palace at Genoa in November, 1560, being then ninety-four years of age. He left no issue, and no very large fortune, owing to his splendid way of living and generous disposition. The Genoese paid great honours to his memory, and lamented his death as a public calamity. Doria was one of the greatest characters that Italy produced during the middle ages, and one of the few that were fortunate to the last. Several individuals of his family have distinguished themselves at various times in the service of the republic of Genoa. A branch of the Doria family are settled at Rome, with the title of princes. (Casoni, *Annali di Genova*; Botta, *Storia d' Italia*.)

DORIANS, the most powerful of the Hellenic tribes, derive their origin from a mythical personage named Dorus, who is generally made the son of Hellen, though he is described as the son of Xuthus by Euripides (Ion., 1590). Herodotus mentions (I. 52) five successive migrations of this race. Their first settlement was in Phthiotis, in the time of Deucalion; the next, under Dorus, in Hestiæotis, at the foot of Ossa and Olympus; the third on Mount Pindus, after they had been expelled by the Cadmæans from Hestiæotis. In this settlement, says Herodotus, they were called the Macedonian people; and he elsewhere (viii. 43) attributes to the Dorians a Macedonian origin; but there does not appear to have been any real connexion between the Dorians and the Macedonians (who, it has been shown, were of Illyrian extraction: Müller, *Dor.*, i., p. 2) beyond this vicinity of abode. The fourth settlement of the Dorians, according to Herodotus, was in Dryopis (afterwards called the Dorian Tetrapolis); and their last migration was to the Peloponnese. Another, and most remarkable expedition, not mentioned by Herodotus, was the voyage of a Dorian colony to Crete, which is stated to have taken place while they were in their second settlement at the foot of Olympus (*Androm. apud Strabon.*, p. 475 D); and Dorians are mentioned among the inhabitants of that island even by Homer (*Od.* xix., 174). The eastern coast was the first part which they occupied. (*Staphylus apud Strabon.*, p. 475 C.) This early settlement in Crete must not be confused with the two subsequent expeditions of the Dorians to that island, which took place after they were well settled in the Peloponnese, the one from Laconia under the guidance of Pollis and Delphus, the other from Argolis under Althæmenes. The migration of the Dorians to the Peloponnese, which is generally called 'the return of the descendants of Hercules,' is expressly stated to have occurred 80 years after the Trojan war, *i.e.* in 1104 B.C. (Thucyd. i., 12.) The origin and nature of the connexion which subsisted between the Heracleidæ and the Dorians are involved in much obscurity. The Dorians were from very early times divided into three tribes, and the epithet *thrice-divided* (τριχάϊκες) is applied to them by Homer in the passage referred to above. These three tribes were called the Hyllæans, the Dymanes, and the Pamphylians. Now the two latter tribes are said to have descended from Dymas and Pamphylus, the two sons of Ægimius, a mythical Doric king, and the first claimed a descent from Hyllus, the son of Hercules.

An attempt has been made to show that the Hyllæans were of Doric origin as well as the other two tribes (Müller *Dor.* i., chap. 3, sec. 2), but we are inclined to infer from the traditions as well as from the duplicate divinities of the Dorians, that the genuine Dorians were included in the two other tribes, and that the Heracleidæ were a powerful Achæan family united with them in a similar manner, but by a stronger tie than the Ætolians under Oxylus, who are also said to have taken part in this expedition. The Heracleidæ, then, with their Ætolian and Dorian allies, crossed the Corinthian gulf from Naupactus, invaded and subdued Elis, which was assigned to the Ætolian chieftain, and bending their steps southward, conquered successively and with greater or less difficulty, Messenia, Laconica, Argolis, Corimth, and Mégaris. In Laconia they were joined by the Cadmæan clan of the Ægidæ, who assisted them in their tedious war with Amyclæ, and afterwards took a part in the colonies to Thera and Cyrene. [Bœotia and Cyrene.] This invasion, which so materially affected the destinies of Greece, was very similar in its character to the return of the Israelites to Palestine. The invaders, who, like the descendants of Abraham, brought their wives and children with them, though they perhaps did not completely abandon their last settlement, which was still called and considered Dorian (Thucyd. i. 107), numbered about 20,000 fighting men on the highest estimate. (Müller, *Dor.* i., chap. 4, sec. 8.) They were, therefore, very inferior in number to the inhabitants of the countries which they conquered; but the superiority of their peculiar tactics ensured them an easy victory in the field, and they appear to have taken all the strong places either by a long blockade or by some lucky surprise; for they were altogether unskilled in the art of taking walled towns.

The governments which the Dorians established in all the countries which they thus invaded and conquered was, as might have been expected, very analogous to that which the Norman invasion introduced into England, namely, an aristocracy of conquest; for while the successful invaders remained on a footing of equality among themselves, all the old inhabitants of the country were reduced to an inferior condition, like the Saxons in England. They were called περίοικοι, or 'dwellers round about the city,' a name corresponding exactly to the Pfahlbürger, or 'citizens of the Palisade,' at Augsburg, who dwelt in the city suburbs without the wall of the city; to the 'pale' in Ireland before the time of James I.; to the people of the contado in Italy; and to the fauxbourgeois in France. (Niebuhr, *Hist. of Rome*, i. p. 398, Eng. tr.; Arnold's *Thucydides*, i. p. 626; and Borghini, *Origine della Città di Firenze*, p. 280, ed. 1584.) All the members of the one class were *gentle*, all those of the other class were *simple*. The constitution of Sparta in particular was an aristocracy of conquest as far as the relations between the Spartans and Lacedemonians were concerned, while the Spartans themselves lived under a democracy with two head magistrates, who were indeed called kings, but possessed very little kingly power. The usual name for a constitution in a Dorian state was an order or regulative principle (κόσμος), and this name appears to have arisen from the circumstance that the attention of the Dorian legislators was principally, if not solely, directed to the establishment of a system of military discipline and to the encouragement of that strict subordination which is the result of it. To bring this about the Dorian population was continually engaged in public choral dances, in which the evolutions of an army were represented, and which served as a rehearsal for actual war. These dances were professedly in honour of the Dorian god, Apollo, who was represented as the inventor of the lyre, their original accompaniment, and also as a god of war, and of civil government, as presiding over the Delphian Oracle, which regulated all the Dorian law systems; but this is merely an expression of the fact that music was an important instrument in the civil and military organization of a Dorian state. Apollo had a duplicate in his sister Artemis, and this, as we have before hinted, points to an antient division of the Dorian race into two distinct tribes. (See Niebuhr, *Hist. of Rome*, i. p. 217, comp. p. 224.) The necessity for such a religion, and such a system of worship depending upon it, is to be explained by the peculiar relation subsisting between the Dorians and their περίοικοι. It was by superior prowess and discipline that they had acquired their rank, and it was only by a continuance of this superiority that they could hope to maintain themselves in the same position. Accordingly, it was important that while the bulk of the population was occupied as much as possible in agricultural employments, the Dorian aristocracy should enjoy sufficient leisure and have every inducement of religion and amusement to practise those martial exercises in which it was so needful for them to excel. The same occasion for strict discipline may also account for the extraordinary austerity which prevailed in most Dorian communities. The Dorian women enjoyed a degree of consideration unusual among the Greeks. The Syssitia, or common tables, which were established in most Dorian states, were designed to admonish those of the privileged class that, living as they did in the midst of a conquered but numerous population, they must not consider themselves to have any individual existence, but must live only for the sake of their order (κόσμος).

In addition to the Dorian settlements which have been already mentioned, this race sent out many colonies: of these the most important were established along the south-west coast of Asia Minor. Rhodes, Cyprus, Corcyra, and Sicily also boasted a Dorian population; Byzantium and Chalcedon were Megarean colonies; and the celebrated cities, Tarentum and Crotona, in Italy, were founded under the authority of Sparta.

The reader will find a full discussion of all questions relating to the history and peculiarities of the Dorian race in Müller's *Dorier*, Breslau, 1824 (translated into English, with additions and improvements by the author, Oxford, 1830); in the second chapter of K. F. Hermann's *Lehrbuch der Griechischen Staatsalterthümer*, Heidelberg, 1836, translated, Oxford, 1836; and in Lachmann's *Spartanische Staatsverfassung*, Breslau, 1836.) Dr. Lachmann adopts the view which we have given of the original two-fold division of the Dorians, but considers the two first tribes to have been the Hyllæans and Dymanes, the Pamphylians being made up of volunteers who joined the expedition to the Peloponnese.

DORIC DIALECT, a variety of the Greek language peculiar to the Dorian race. It was spoken in the Dorian Tetrapolis; in the greater part of the Peloponnese; in the numerous Dorian colonies in Italy, Sicily, and Asia Minor; in Crete, Ægina, Rhodes, Melos, Corcyra, and Cyrene. As a written language it is divided by grammarians into two classes, the old and new Doric. In the former Epicharmus, Sophron, and Alcman wrote; in the latter Theocritus, Bion and Moschus. The lyric poets in general wrote in the Doric dialect; but Pindar, perhaps the greatest of them, at all events the best known to us, wrote a language based upon the epic or Ionic dialect, but with a liberal use of Doric and Æolic forms. (Hermann *de Dialecto Pindari*, Opuscula, i. p. 247.) The choruses in the Attic plays are written in a kind of Doric; which circumstance (as well as the use of Doric words by Pindar, a Theban) is to be accounted for by the Dorian origin of lyric poetry; for as Herodotus, although a Dorian, wrote his history, which is a kind of epic, in the Ionic dialect, because that was the prescribed language for epic poetry, so all writers of odes adopted the Doric more or less, because the oldest lyric poems were written in that dialect. The existing monuments of the pure Doric, in addition to the fragments of the old writers which have been carefully collected, are the specimens in the comedies of Aristophanes, the treaties and decrees quoted by the Athenian historians and orators, and the scriptions collected by Chandler, Mustoxidi, and Böckh. The peculiarities by which the Dorian dialect was distinguished from the other varieties of the Greek language are to be attributed to the mountain life of the Dorians in their earliest settlements. We always find a tendency in the formation of broad vowel sounds in the language of mountaineers, and this fondness for the α and ω, which the Dorians generally used where η and ου were used in other dialects, and also their aversion to sibilants, is perfectly analogous to what we observe in other languages which are spoken both by highlanders and lowlanders. The use of the article in the Greek language is attributable to the Dorians, the poetry of Alcman having first introduced into the literature of Greece. The older language, which is called the Æolian or Pelasgian, and to which, according to Strabo, pp. 333 and 679, the Doric bore the same relation as the Attic did to the Ionian, was entirely without the article, as we may see in the Latin branch of it. On the Dorian dialect the reader may consult in addition to Maittaire and Gregory of Corinth, who have written on the Greek dialects in general, the excellent remarks of Müller, *Dorians*, vol. ii., Appendix viii., p. 484, &c., English translation.

DORIC ORDER. [CIVIL ARCHITECTURE; COLUMN.]

DORIPPE (Fabricius), a genus of brachyurous decapod crustaceans belonging to the subdivision which have the feet of the fourth and fifth pairs elevated on the back, and not terminated with paddles, and the eyes supported upon simple peduncles (*Notopoda*). The genus is adopted by Latreille, Lamarck, Leach, Bosc, and Risso: it is the *Notogastropus* of Vosmaer, and was comprehended under the general term *Cancer* by Linnæus, Herbst, Aldrovandus, and Plancus.

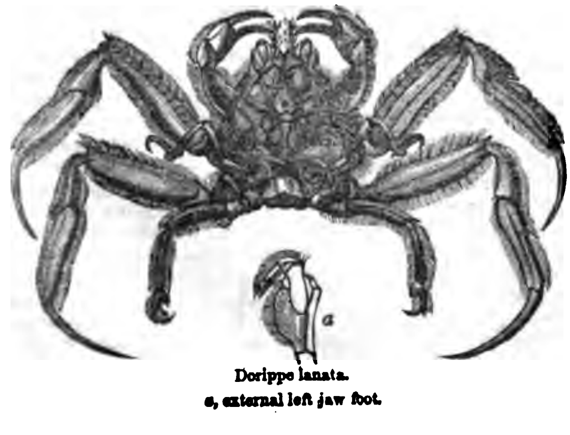
Generic character.—External *antennæ* rather long, setaceous, inserted above the intermediate ones, which are folded (pliées), but not entirely lodged in the cavities where they take their insertion: third joint of the external *jaw-feet* (pieds-mâchoires) straight, elongated, terminated in a point, *buccal opening* triangular: *claws* (chelæ) small, short, equal; the other *feet* very long and compressed, the third pair being the greatest; the two last pair elevated upon the back, and terminated by a small hooked nail, which is folded back upon the next joint: *carapace* slightly depressed (the sides wider posteriorly than they are anteriorly), truncated, and spinous before; truncated, sinuous, and bordered behind; the surface marked with small humps or tubercles, which correspond exactly to the regions proper to the soft parts beneath: two great oblique openings, ciliated on their edges, communicating with the branchial cavity, and situated below the head, one at the right, the other at the left of the mouth: inferior and posterior part of the body truncated into a kind of gutter to receive the reflected abdomen, the pieces of which are nodulous or tuberculous: *eyes* small, lateral, supported on rather long peduncles, placed near the angles of the head, and protected by its angular projections, which form the edges of their orbits. (Desmarest.)

Geographical Distribution.—Probably wide on the sea-coasts of warm climates, where the water is deep. The Mediterranean and Adriatic seas, and Manilla, are among the localities given.

Habits.—Not well known. The species haunt great depths in the sea, nor has it yet been proved whether they make use of the feet elevated on the back to cover themselves like the *Dromiæ* with foreign bodies. It is however very probable that such is their use.

Example, *Dorippe lanata*, Latreille, Lamarck; *Dorippe Facchino*, Risso; *Cancer lanatus*, Linnæus; *Cancer hirsutus alius*, Aldrovandus.

Description.—Four dentations in the front and a very strong lateral point, forming at the same time the angle of the head and the external border of the orbit. A short point on the middle of each side of the carapace. Anterior border of the thighs of the second and third pair of feet without spines. Fingers of the chelæ compressed and arched within, having their internal edge armed with a series of dentilations, which are rather strong, oblique, equal, and white. Body often covered with reddish down.



Dorippe lanata.
a, external left jaw foot.

Locality,—the Mediterranean and the Adriatic. The inhabitants of Rimini call it *Facchino*. (Desmarest.)

FOSSIL DORIPPE?

Desmarest (Histoire Naturelle des Crustacés Fossiles, 1822), describes a species, *Dorippe Rissoana*, which has some resemblance to the species above figured and described, and still more to the crab figured by Herbst under the name of *Cancer Frascone;* and above all, to a species brought from New Holland by Péron, and named *Dorippe nodosa*. Desmarest observes that he is the more inclined to consider it as approaching very near to this last, inasmuch as he had thought that the specimen which he had described might not be in reality fossil. In fact, he adds, that though brown and shining, like the fossil crabs which come from the East Indies, it is much lighter, more friable, and not so much imbedded in the clay as they are. In his 'Considérations Générales sur la Classe des Crustacés,' (1825,) he describes the *Dorippe à quatre dents* with the synonyms *Dorippe quadridens*, Fabr. Latr.; *Dorippe nodosa*, Coll. du Mus.; *Cancer Frascone*, Herbst. 'This *Dorippe* from the East Indies,' he adds, 'has lately been brought from Manilla by M. Marion de Procé. It so much resembles a species which I have described with doubt as fossil, that I know not how precisely to point out the difference. This species belongs to M. Defrance, who has stated its characters in the article 'Dorippe' (fossil) of the Dict. des Sc. Nat.'

DORKING. [SURREY.]

DOROG, a market town of eastern Hungary, in what is called the 'Haydu Varosok,' or privileged district of the Haydukes, lying north-east of Böszörmény, the head town of that district, in 47° 30′ N. lat. and 21° 20′ E. long. (according to the Austrian quartermaster-general's map). It contains about 920 houses and 6650 inhabitants.

DORPAT, or **DOERPT**, a circle in the north-eastern part of the Russian government of Livonia, bounded on the north by Esthonia, and lying in the large subdivision of the empire, called 'The Provinces of the Eastern Sea,' or Baltic. It has an area of about 4267 square miles, and contained, in 1792, 130,904 inhabitants; in 1816, 140,606; and in 1833, 179,819. There are 2 towns (Dörpt, or Dörpat, and Verroe), 20 parishes, 206 equestrian estates, and 15,331 small farms in the circle. Ridges of low hills and gentle eminences occur alternately with lakes, streams, marshes, forests, and cultivated plains: the largest lake, next to its eastern boundary, lake Peipus, the western side of which, together with a portion of the bay of Pskow, belongs to this circle, is the Vürzyerva, which is navigable, and discharges its waters through the river Embach into the Peipus. Independently of the Little Embach, which enters lake Vürzyerva from the south, and the Great Embach, which flows out of that lake into the Peipus, and is navigable from the town of Dörpat, the circle has no streams of any note: one of them, the Schwartzbach, contains pearls. The forests are of considerable extent, and in conjunction with the cultivation of buckwheat, flax and hemp, and the fisheries, afford employment to the people. A considerable quantity of cattle are reared. The only mechanical occupations are sawing timber, for which there are 18 mills, and making potashes, and a small quantity of paper. Verroe, the second town, which lies on a lake in 57° 48′ N. lat. and 27° 3′ E. long., has a Lutheran and a Greek church, and about 3500 inhabitants.

DORPAT, or **DOERPT** (in Esthonian, Tart Ling, and in Livonian, Tehrpata), the chief town of the circle, is agreeably situated at the foot and on the declivity of an eminence, part of a range of hills, about 200 feet high, which rise abruptly from the spacious plain below, and is built on each bank of the Great Embach, in 58° 22′ N. lat. and 26° 42′ E. long., 290 versts (about 193 miles) north-east of Riga. The river is crossed by a handsome bridge of granite of three massive arches, and the town, which is embellished with gardens, forms a semicircle, laid out in straight broad streets, which are kept very clean, and adorned with some handsome public buildings of freestone, particularly the government offices and university buildings. The houses, constructed either of bricks or wood, the walls and roofs of which are painted in showy colours, do not in general exceed one story in height. The eminence, at the north-western extremity of the town, is approached from one of the principal squares, and laid out in avenues and walks: the summit is called the 'Place of the Cathedral,' from its having been the site of a cathedral which was burned down in the great fire of 1775, and is at present the site of an observatory, admirably supplied with instruments by the well-known astronomer, Dr. Struve, as well as of the university library and medical school. In the middle of the sixteenth century Dörpat had a cathedral and seven churches within the walls, besides three outside of them, but at present it has only one Lutheran and one Greek church. In 1782 it had 546 houses and 3603 inhabitants; in 1816 the population had increased to 7376; and at present the number of houses is about 1200, and the population is about 11,000. In 1833 it was 10,802; viz., 5011 males and 5791 females; and in 1835 the births were 772 and the deaths 653. Internal trade, the navigation of the Embach, and the wants of those who are connected with the university afford employment to the people of the town. They also hold a large annual fair in January for the sale of Russian and foreign manufactures. The university was founded in 1632 by Gustavus Adolphus, at a time when Livonia, Esthonia, and Ingria, belonged to the Swedish crown, but was suppressed by Alexis Michaelovitsh in 1656. The Swedes having however recovered possession of Livonia, it was re-established in 1690: in 1699 they transferred it to Pernau; and in December, 1802, it was reconstituted by the Emperor Alexander for the benefit of Livonia, Esthonia, and Courland, the nobility of which elect a curator or superintendent, who, conjointly with its heads, administers its revenue, which amounts to about 5800*l.* a year (126,000 roubles). The university, which is open to students of every religious persuasion, consists of the four faculties of theology, law, medicine, and philosophy; has 30 professors, and is attended by about 580 students. It has a library of nearly 60,000 volumes, and suitable collections for natural and experimental philosophy, mineralogy, zoology, anatomy, and pathology, &c.; a botanical garden, clinical institutions, a theological and a philological seminary, an establishment for educating Russian professors, a gymnasium, and a school for educating teachers in the elementary schools. Public education throughout Livonia, Esthonia, and Courland, is under the direction of the University of Dörpat.

DORR-HAWK. [Goatsuckers.]

DORSET. [Sackville.]

DORSETSHIRE, an English county, bounded on the east by Hampshire, on the north by Wiltshire, on the north-west by Somersetshire, and on the west by Devonshire: along all its southern borders it is washed by the English Channel. Dorsetshire is for a short distance separated from Hampshire by a rivulet which joins the Avon of Wiltshire and Hampshire above Christchurch: for a short distance it is separated from Somersetshire by the Ivel or Yeo, and the brooks that run into it; and in the west it is separated from Somersetshire and Devonshire by the Axe and some small streams that run into that river.

The form of the county is very irregular, and one small part is entirely detached from the rest and inclosed by Devonshire. Its greatest length is from east to west, from Alderholt, near Fordingbridge, in Hampshire, to the western extremity of the detached part, which is inclosed within the boundary of Devonshire, 57 or 58 miles: but from the irregular course of the boundary, the line joining these two points is not wholly in Dorsetshire. The breadth from north to south varies much; the greatest breadth is from the spot where the river Stour enters Dorsetshire to Portland Bill or Point, 40 miles: at the eastern extremity, along the Hampshire border, the breadth is 16 miles; at the western extremity, near Lyme Regis, only 5 miles. The area, as given in the table in Arrowsmith's large map of England and Wales, and in the population returns, is 1006 square miles, or 643,840 acres: the population in 1831 was 159,252, or about 158 to a square mile. In respect of size, it is below the average of the English counties; and in respect, both of amount and density of population, very much below. Dorchester, the county town, is 115 or 116 miles from St. Paul's, London, in a straight line south-west by west, or 119½ from Hyde Park Corner by the road through Basingstoke, Andover, Salisbury, and Blandford.

Dorsetshire is included between 50° 30′ and 51° 5′ N. lat., and 1° 45′ and 3° 7′ W. long. Dorchester is in 50° 43′ N. lat. and 2° 26′ W. long.

Coast, Bays, and Islands.—At the eastern end of Dorsetshire the coast is precipitous; but the cliffs extend scarcely a mile south-west from the border of Hampshire, and are succeeded by a low sandy tongue of land, running about a mile farther in the same direction to the narrow entrance of Poole harbour. This bay penetrates six miles inland towards the west, and expands to a breadth of four or five. Its outline is very irregular, and it forms several small bays; as Hole's Bay, Lytchet Bay, Arne Bay, &c. It receives the Frome, the Piddle, and other streams: it consists for the most part of banks of mud, which are dry at low water, and covered with sea-weed, and are separated from each other by deeper channels. The town of Poole is on a peninsula at the entrance of Hole's Bay, on the north side of the harbour. There are several islands in Poole harbour; Brownsea or Brownsey, the largest, which lies near the entrance of the harbour, is a mile and a half long from east to west, and nearly a mile broad. It is sandy, partly covered with heath, furze, and fern, and partly cultivated or laid out in a plantation. There are on it an old castle and one or two tenements. The water is so shallow in Poole Harbour, except in the channels, that only small or lightly-laden boats can pass over the banks, even at high water; several of the channels are only sufficient for fishing boats and small craft: the Wareham and Main channels, the south or Wych channel, and that which leads to the town of Poole, are navigable for larger vessels. The shore round Poole harbour is low, and near where the Frome falls into it the land is protected from inundation by an embankment.

From the entrance of Poole harbour a low shore runs southward nearly three miles, and then becomes steep and turns eastward, forming Studland Bay, the southern limit of which is Handfast Point. From Studland Bay, the coast, still for the most part abrupt, runs about 4 miles south by west to Peverel Point and Durlston Head, forming the two small bays, Swanage or Swanwich Bay and Durlston Bay. From Durlston Head a precipitous coast runs west by south 5 miles to St. Aldhelm's or St. Alban's Head (344 feet high, B.), and from thence in an irregular line west by north 17 or 18 miles to Weymouth Bay, forming several small bays, such as Chapman's Pool, Kimmeridge Bay, Worbarrow Bay, Lulworth Cove, and Ringstead Bay. The cliffs which extend from Peverel Point to the neighbourhood of Weymouth are a longitudinal section of the high land which forms this part of the coast.

The shore of Weymouth Bay is low, and extends 2 miles south to the towns of Melcomb Regis and Weymouth: here the cliffs recommence, and run 1 mile south-west to Sandsfoot Castle, from whence a low shore extends 2 miles south by east to Portland Castle, on the peninsula or Isle of Portland. The lofty coast of this island takes a circuit of 5 or 6 miles to the Bill of Portland, the southernmost point of the county, and from thence above 3 miles northward to the commencement of the Chesil Bank, which connects the north-west extremity of the Isle of Portland with the main land. The bay between Weymouth and the Isle of Portland is called Portland Road.

The Isle of Portland is about four miles long, and in the widest part nearly one and a half broad. It is one continued bed or rock of freestone. The highest point in the island is 458 feet (B.) above the level of the sea: the cliffs on the western side are very lofty; those at the Bill are not more than 20 or 30 feet. There is sufficient depth of vegetable soil to render the island tolerably productive, but not sufficiently so for the entire sustenance of the population, who get much of their provisions from Weymouth. Water is plentiful and good; one stream has sufficient volume to turn a mill. The herbage is very fine, and affords pasturage to a number of sheep, whose flesh is considered to be excellent mutton. In wet seasons the meadows produce a good crop of grass, but in a dry spring it is so much parched as not to be worth mowing. The arable land is mostly common field; what inclosures there are, are bounded by stone fences: wheat, oats, peas, and a little barley are grown; sainfoin is also cultivated. The grain harvest is small, but the corn is fine, and in request for seed. There are very few trees in the island except a few elms in the southern part; and from the scarcity of other fuel, the islanders are obliged to use dried cow-dung mixed with the stubble of their corn, which they gather for the purpose. (Hutchins's *Dorsetshire*, vol. ii. p. 354, 2nd edit., Lond., 1796-1815.) The whole island is included in one parish, which contained in 1831 a population of 2670. The islanders are a robust race, peculiarly adapted to the hard labour of quarrying stone, in which a considerable number are employed: they are not long-lived, which is ascribed to their free use of ardent spirits. (Hutchins's *Dorsetshire*.) They occasion ally engage in fishing, and some few are employed in agriculture, trade, and handicraft. The custom of gavelkind prevails here. The island has one village, Chesilton, at the commencement of the Chesil bank, on the north-west side of Portland: there are several hamlets. There are two castles; one, on the east shore of the isle, is very antient, and built in the form of a pentagon, with a number of small loop-holes, whence it has been vulgarly called 'Bow and Arrow Castle:' it is sometimes called Rufus's Castle. The other is on the northern side of the island, built by Henry VIII., and, in connexion with Sandsfoot Castle, commands Portland Road: a few guns are still mounted. Near the Bill are two lighthouses. The quarries will be noticed hereafter. Masses of rocks extend under water to a considerable distance from the island. A dangerous surf, called 'The Race of Portland,' extends from the west of the island eastward to St. Aldhelm's Head. Portland Road is sheltered from the south-west wind, and affords good holding ground at eight or nine fathoms.

Leland, Hollinshed, and Camden agree in speaking of Portland as having been once separated from the main land; but it has long been united to it by the Chesil Bank, one of the longest and most extraordinary ridges of pebbles in Europe. From its commencement at the Isle of Portland, near the village of Chesilton, to which it gives name, it extends in a remarkably straight line north-west for many miles, not joining the shore at the part nearest to Portland, but running parallel to the coast, from which it is separated by a narrow arm of the sea called 'The Fleet,' as far as Abbotsbury, 10 miles from Portland: here it unites with the main land and runs along the shore nearly six miles further to the commencement of the cliffs at Burton Castle, not far from Bridport. The breadth of the Chesil Bank is in some places near a quarter of a mile, but commonly much less. The base is formed of a mound of blue clay, which is covered to the depth of four, five, or six feet, by a coat of smooth round pebbles, chiefly of white calcareous spar (these are called Portland pebbles), but partly of quartz, chert, jasper, &c., so loose that a horse's legs sink almost knee deep at every step. The bank slopes on the one side toward the open sea, and on the other toward the narrow inlet intercepted by it: it is highest at the Portland end, and is there composed of pebbles as large as a hen's egg; but they diminish in size towards the west so regularly, that it is said the smugglers who land in the night can judge where they are by examining the beach; at Abbotsbury they are little bigger than horse-beans. Marine plants grow in patches along the edge of the bank by the water-side. The pebbly covering is continually shifting: a north-east wind sometimes clears away the pebbles in parts, leaving the blue clay exposed; but the denuded spaces are covered again with pebbles by the heavy sea which the south-west wind brings up. 'The Fleet' receives the water of several rivulets, and runs into the open sea at its south-eastern extremity by a narrow channel called 'Small Mouth:' it is in some places half a mile broad; there are two or three passages or causeways over it. At the north-western extremity it forms a 'swannery,' which once consisted of 7000 swans. The Fleet is much frequented by water-fowl, among which Dr. Maton observed the wild swan. (Hutchins's *Dorsetshire*; Smeaton's *Hist. of the Edystone Lighthouse*; and Maton's *Western Counties*.)

From Burton Castle the coast, generally abrupt and frequently high, runs W.N.W. ten or twelve miles to the border of Devonshire: the cliffs in this part are remarkable for the beauty and variety of the fossils which they contain. The whole extent of the Dorsetshire coast, including the circuit of the Isle of Portland, may be estimated at above 75 miles.

What is sometimes called 'the Isle of Purbeck,' being really a part of the main land, is not noticed here; it comprehends the peninsula formed by the river Frome and Poole Harbour on one side, and the sea on the other.

Surface, Hydrography, Communications.—The surface of this county is for the most part uneven. The principal elevations are the chalk downs, which, entering Dorsetshire from Wiltshire on the northern side of Cranbourne Chase, two or three miles south-east of Shaftesbury, turn to the south, and run to the valley of the Stour, in the neighbourhood of Blandford. In this range of downs, some parts of which are covered with wood, are Melbury Down, Ashmore Down, Fontmell Down, Iwerne Free Down, Busby Down, Preston Down, Main Down, Gunville Down, Pimperne Down, Stowerpaine Down, Furze Down, Camp Down, and Mill Down, with the outlying eminences Hod Hill and Hamilton Hill. From the valley of the Stour the chalk downs run nearly west to the neighbourhood of Beaminster, and form the northern boundary of the basin whose drainage is received by Poole Harbour. In this part we have Okeford Hill, Bell Hill, White Hill (between the last two is Bulbarrow, 927 ft. high) (A.), Great Ball, Little Ball, Revels Hill, Dogberry Hill, High Stoy, 891 ft. (A.), Highcombe Hill, Row Hill, East Hill, West Hill, Evershot, Rampisham, Corscombe, and Beaminster Downs, Whitesheet Hill, and Horn Hill. The foregoing eminences belong to the range of the 'North Downs,' and lie along the northern escarpment of that range. The hills near Beaminster form, with the exception of some outlying masses, the western extremity of the great chalk formation. The chalk hills from Beaminster run south-east or east, and form 'the South Downs,' the highest points in which are along the southern escarpment. The hills gradually approach the coast a few miles north-east of Melcombe Regis. In this range we have Hackthorn Hill, Chilfrome Down, Eggardon, where is an old entrenchment, Chilcombe Hill, Little Bredy Down, Black Down, 817 ft. (A.), Whaddon Down, Ridgeway Down, and Bincombe Down (if these be not two names for the same), Came Down, Moignes or Maine Down, Holworth Down, and Chaldon Down. From Lulworth the chalk hills run eastward to Handfast Point, the headland which separates Studland and Swanage Bays. In this part of the range are Purbeck Hill, Knowl or Norden Hill, west of Corfe Castle, 369 ft. (B.), Corfe Castle Hill, 207 ft. (B.), Challow Hill, east of Corfe Castle, 390 ft. (B.), Nine Barrow Down, 625 ft. (B.), or 642 ft. (O.), and Ballard Down.

Pillesdon Pen, west of Beaminster, which is 934 ft. high (O.), is the highest point in the county, and belongs to the green sand formation. Swyre Hill, on the coast, near Kimmeridge, in the Isle of Purbeck, is 669 ft. high. (B.) For the above elevations we have given our authorities: O. the Ordnance Survey; A. Arrowsmith's 'Map of England and Wales;' and B. Dr. Berger in 'Geol. Trans.' vol. i. p. 268.

The Stour, the chief river of Dorsetshire, rises in Wiltshire, in Stourhead Park, on the border of Somersetshire, and running south-by-east, enters Dorsetshire between 3 and 4 miles from its source. After flowing about 4 miles farther in the same direction, it receives the Shreen Water from the north, and soon after the Lidden River from the north-east. It then flows in a very winding channel, south-south-east, for 8 miles, to the junction of the Cale, which comes from the neighbourhood of Wincanton, in Somersetshire. From the junction of the Cale the Stour flows south about 3 miles to the junction of the Lidden, and thence winds to the east past the town of Sturminster Newton, and through a depression in the range of the North Downs, and passes in a south-east course to the town of Blandford Forum, after which it flows south-east for 20 miles to the village of Corfe Mullen; and from thence 4 miles east to the junction of the Allen, which flows from the north near Cranbourne. After it receives the Allen the Stour flows east-south-east 6 or 7 miles into Hampshire, after entering which it receives a considerable stream, 16 or 18 miles long, from Cranbourne; and about 4 miles lower it joins the Avon near Christchurch, in Hampshire. The whole course of the Stour is nearly 65 miles, for 40 of which, viz. up to Sturminster Newton, it is navigable.

The river Yeo, Ive or Ivel, is formed by two brooks, one rising in Somersetshire, and one in Dorsetshire, which uniting near Milbourne Port (Somersetshire), and flowing south-west, enter Dorsetshire between Milbourne Port and Sherbourne, about three miles from their respective sources. The Yeo then flows first west-south-west, then west-north-west for about seven miles, when it again touches the border of Somersetshire, along which it winds for about three miles, and then entering Somersetshire flows north-west into the Parret. The Stour and the Yeo carry off the drainage of all that part of the county which lies north of the North Downs.

The North and South Downs inclose the basin of the two rivers Piddle or Trent and Frome, which unite in Poole Harbour below Wareham, and from their situation with respect to that town are respectively called Wareham North and Wareham South river. The Piddle rises in the village of Alton on the southern declivity of the North

Downs, and flows south and south-east past Piddletrenthide and Piddlehinton to Piddletown. From Piddletown it has a general east-south-east course to its entrance into Poole Harbour. Its whole course is about twenty-two miles; or, if we add seven or eight for the length of the low water channel through the æstuary of Poole Harbour, 30 miles.

The Frome rises on the Downs near Corscombe, north-east of Beaminster, and flows south-east. At Maiden Newton it receives a stream from the Downs near Beaminster. From Maiden Newton the Frome flows south-east eight miles to Dorchester. From Dorchester the Frome flows east nearly twenty miles into Poole Harbour, just upon entering which it unites with the Piddle, and has the same low water channel as that river: its whole length is about thirty-five miles, or, including the channel through Poole Harbour, forty-two or forty-three miles. For a considerable part of their course both the Frome and the Piddle flow through low meadows; the channel of each is repeatedly divided and reunited. They are not navigable, at least above Wareham.

The western extremity of the county is watered by the Bredy, the Brit, the Char, and the Axe, which last rather belongs to Devonshire. The Bredy flows westward seven or eight miles from Little Bredy into the sea, near Burton Bradstock, at the north-west extremity of the Chesil Bank. The Brit rises near Beaminster on the southern slope of the chalk hills, near the junction of the North and South Downs, and flows south about nine miles into the sea below Bridport: the mouth of it forms Bridport Harbour. The Char is about as long as the Brit; it rises near Pillesdon Pen, and flows south and south-west into the sea at Charmouth: it receives many brooks. The Axe rises in Dorsetshire, and flows for some miles along the border of the county.

Dorsetshire has no canals. The Dorset and Somerset canal, for which acts were obtained in 1796 and 1803, but which was never executed, was to have entered the county near Stalbridge, and to have followed the valley of the Stour till it opened into that river above Blandford Forum. The intended English and Bristol Channels' ship canal was to cross the western extremity of the county. There is a short railway from the clay pits at Norden, near Corfe Castle, to the Quay on Middlebere Channel, Poole Harbour.

The Penzance, Falmouth, and Exeter mail-road crosses the county in nearly its whole extent. It enters it near Woodyates' Inn, between Salisbury and Blandford, and runs south-west through the latter town, Winterbourne Whitchurch, Milbourne St. Andrew, and Piddletown to Dorchester; and from thence west by Winterbourne Abbas, Bridport, Chidcock, and Charmouth to Axminster in Devonshire. The Exeter mail-road crosses the northern part of the county, entering it near Shaftesbury, and running thence sometimes in Somersetshire and sometimes in Dorsetshire, by Sherbourne to Yeovil in Somersetshire. It just crosses the western extremity, and the detached portion of the county between Chard and Honiton. The Falmouth, Devonport, and Exeter mail-road also just crosses the western part of the county. The Southampton and Poole mail-road enters the county beyond Ringwood, and runs by Wimbourne Minster to Poole. Roads run from Dorchester to Weymouth, to Wareham, Corfe Castle and Swanage, to Beaminster and Crewkerne, and to Sherbourne; from Shaftesbury to Sherbourne, to Sturminster Newton, and to Blandford, and from Blandford to Wimbourne.

Geological character.—The direction of the chalk-hills, which has been already noticed, furnishes the key to the geological structure of Dorsetshire. The North and South Downs, which respectively extend westwards from the neighbourhood of Shaftesbury and the Isle of Purbeck, and unite at their western extremity near Beaminster, inclose a basin, 'the Trough of Poole,' in which we have the formations superior to the chalk; beyond or without this basin we have the formations which underlie the chalk.

The eastern part of the county, as far as Cranbourne, Chalbury and Wimbourne Minster, and the Trough of Poole (bounded on the north by a line drawn from Wimbourne by Bere Regis and Tolpiddle to Stinsford near Dorchester, its western extremity, and on the south by a line drawn from Broad Mayne along the northern slope of the South Downs to Studland bay) are occupied by the plastic clay. The undulations of the surface occupied by this formation are considerable. Potters' clay in beds of various thickness and at different depths alternates with loose sand in this formation in the Trough of Poole. It is sent to Staffordshire, where it is mixed with ground flints and employed in the finer kinds of pottery. Beneath the potters' clay lies a seam of very friable earthy brown coal, which crumbles when put into water, burns with a weak flame, emitting a particular and rather bituminous smell, somewhat like Bovey coal. An extensive horizontal bed of pipeclay skirts the northern declivity of the South Downs, and it contains a bed of coal exactly resembling that of Alum Bay in the Isle of Wight; clay of the same bed, but not of equal quality may be found in other parts of the Trough of Poole. It is quarried extensively near the town of Poole, where clay for fire-bricks is also dug. Near Handfast Point the sand of this formation passes into sandstone. The plastic clay is found capping one or two hills south-west of Dorchester.

The chalk formation bounds the plastic clay. In the North Downs the chalk occupies a breadth of nearly ten miles, viz., from Shaftesbury to Cranbourne and along the valley of the Stour from above Blandford to Wimborne Minster: at its western extremity the formation is still broader, extending about eighteen miles from beyond Beminster to Stinsford near Dorchester. On the southern side of the Trough of Poole it becomes much narrower, scarcely averaging two miles in breadth. The cliffs along the south coast are partly chalk: the strata are in some places curved and occasionally vertical. The valleys, drained by the upper part of the Frome and its tributaries, are occupied by the green sand, so that the mass of the chalk-hills about Beminster is cut off from the rest of the formation.

The remainder of our geological notice must be arranged in two parts: the first referring to the district south of the chalk range and extending to the coast: the second referring to the district west and north-west of the same range. We shall first speak of the southern districts.

The chalk marle, green sand, weald clay, and iron sand skirt the chalk in the order in which we have named them in the Isle of Purbeck, and extend along the coast between the chalk and the Purbeck and Portland limestone next to be noticed. The iron sand near Lulworth contains imperfect beds of wood-coal. The weald clay is not found at all the coast west of the Isle of Purbeck.

The Purbeck strata, belonging to the upper series of the Oolitic formation, consist of argillaceous limestone alternating with schistose marle: they crop out from under the iron sand in the Isle of Purbeck. A variety of the Purbeck stone, known as Purbeck marble, was formerly much used for columns and ornaments in our cathedrals and old churches, but is now out of use. The thickness of the Purbeck beds is estimated at 290 feet. The Portland Oolite, another member of the same series, which succeeds the Purbeck stone, occupies the remainder of the Isle of Purbeck and the whole of that of Portland. It consists of a number of beds of a yellowish white calcareous freestone, generally mixed with a small quantity of siliceous sand. But the different beds of which it is composed often vary in their characters, nor are the same beds of an uniform character in different localities. The varieties of this formation afford the greater part of the stone used for architectural purposes in London.

The Portland stone came into repute in the time of James I., who used it by the advice of his architects in rebuilding the banqueting-house at Whitehall. After the great fire of London, A.D. 1666, vast quantities of this stone were used in rebuilding St. Paul's and other public edifices. A considerable portion of Westminster Bridge and the whole of Blackfriars Bridge are built of it. The quarries are thus described by Mr. Smeaton in his 'Narrative of the Building, &c., of the Edystone Lighthouse:'

'The first thing that excited my curiosity was the very subject I came upon; that is, the quarries from whence the stone sent from Portland is produced. The upper surface of the island I found was totally flat, but elevated above the sea, according to the estimation of my eye, at least [illegible] feet.* The stratum of stone, that is wrought for sale, lies nearly parallel with the upper surface of the island, and with not much cover of earth or rubbish upon it. There are several beds of stone, lying in contiguity one above another, varying in thickness in general from two to four feet, and upward. Those which are usually called the merchantable beds (on account of the blocks for sale being produced therefrom) are universally covered with a stratum called the cap, which is formed entirely of a congeries of petrified sea shells of a great variety of kinds, but in general so distinct and separate in their forms that to the curious naturalist their species seem very easy to be made out; but as they, in a considerable degree, retain their respective figures (though in some places more, in some less), spaces or cavities are left between them, which consequently very much diminish the coherence of the mass; but yet the cementing principle is so strong that the whole together is considerably harder than the merchantable beds; and indeed so hard that, to get rid of it as easily as possible, it is generally blasted off with gunpowder. Were it not for these cavities the capstone would not readily be worked with tools; or, at least, it would not be worth working at a place where there is so great a plenty of stone of a better quality; but as it is necessary to remove it in the course of working the better kind of stone, though by far the greatest proportion is blasted into fragments, yet for the buildings in the island the capstone is in general use, and also for the piers and quay walls of Weymouth harbour; as also in the pier for shipping stone at Portland blocks are used from the cap; and indeed were it not for the expense of freight (which is the same as upon those of the best quality) for various rough purposes under water, &c., the cap would make quite as good and durable work as the merchantable blocks.

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* The highest point as we have seen is much higher than this.

'When the merchantable beds are thus cleared of the cap, the quarry-men proceed to cross-cut the large flats, which are laid bare with wedges in the way I have described as to the moorstone: only the wedges are not so numerous, nor does Portland stone split so evenly as granite; and frequently in the splitting as well as other working of this stone, oysters and other fossil shells are discovered in the solid substance of the merchantable stone. The beds being thus cut into distinct lumps, the quarry-man, with a tool called a kevel, which is at one end a hammer and at the other an axe, whose edge is so short or narrow that it approaches towards the shape of a pick, by a repetition of sturdy blows soon reduces a piece of stone with his eye to the largest square figure which it will admit, and blocks are thus formed from half a ton to six or eight tons' weight, or upwards, if particularly bespoke.'

The strata of stone of all kinds on the east side of Portland have an aggregate thickness of 93 feet, on the west side of 112 feet. The 'cap' is at present only burnt for lime. The Kimmeridge clay, a blue slaty or greyish yellow clay which also belongs to the upper Oolitic series underlies the Portland stone: it sometimes contains beds of a highly bituminous shale, which from their being found near Kimmeridge in the Isle of Purbeck, have obtained the name of Kimmeridge coal, and have given to the whole formation the name of Kimmeridge clay. The shale burns with a yellowish flame, giving out a sulphureous smell. The thickness of the Kimmeridge clay is estimated at 600 or 700 feet. It forms the base of the Portland Oolite in the Isle of Portland, and the line of junction between the two formations is elevated on the north side of the island far above the level of the sea. The coasts of the island are here formed by a sloping bank of Kimmeridge clay, surmounted by an abrupt escarpment of Oolite. On the south side of the island by the dip of the strata towards the south the line of junction is brought down to the level of the sea.

Towards the south-western shore of the Isle of Purbeck where the chalk downs approach the sea, and are skirted only by a very narrow belt occupied by the iron sand, and beyond that seaward, by the Portland Oolite, the sea has formed several singular coves, at the entrance of which are lofty headlands of Oolite; while the cove or basin is excavated inland as far as the chalk. The precipitous sides of these basins exhibit in a most striking manner the formations between the chalk and the Oolite.

Westward of the coves just described, extending from Weymouth bay towards the river Brit, occurs what is termed by Geologists 'a saddle,' a double series of formations. After the green sand, Purbeck, and Portland beds, and Kimmeridge clay have successively cropped out from beneath the chalk, the coral rag and Oxford clay, members of the middle series of Oolites rise to the surface in succession, and are succeeded by the Forest Marble and the Great Oolite, which belong to the lowest series of the Oolitic formations. To the southward of the Great Oolite and Forest Marble the superior strata re-appear in reverse order of succession; the Oxford clay, then the coral rag, and then the Kimmeridge clay, which runs down to the shore at Weymouth, and rises again from the sea in the Isle of Portland, where it appears capped with the Portland Oolite.

In the north-western and western parts of the county, the chalk formation is succeeded by the green sand, which crops out from beneath it, and skirts the northern side and the western extremity of the North Downs. The green sand forms the outlying masses of Pillesdon and Lewston hills, and of others yet farther west along the border of Dorsetshire and in the county of Devon. [DEVONSHIRE.] Neither the iron sand nor the weald clay, nor so far as we are aware, the chalk marle, appears to be found in this part of the county.

West of Shaftesbury extends a bed of Kimmeridge clay which crops out from under the green sand: west of the Kimmeridge clay is a range of coral rag hills; and still furthef west occur the Oxford clay, and the Great Oolite. All these formations are overlaid by the westward extension of the chalk and green sand from the valley of the Stour to Beaminster; but some of them re-appear in the cliffs which line the coast westward of the Chesil Bank.

The western extremity of the county is occupied by the lowest members of the Oolitic series and by the Lias. The line of junction of these formations extends nearly north and south from Ilminster in Somersetshire to the sea. Insulated masses of green sand frequently cover both the Oolites and the Lias, and render it difficult to trace the line of junction. The detached part of the county which is enclosed within Devonshire is partly occupied by the red marle foundation.

Agriculture.—The climate of Dorsetshire, though mild and healthy, is not so warm as its geographical situation would lead us to expect; a circumstance owing to the nature of the soil and the bareness of its chalk hills, there being little or nothing to break the force of the winds that sweep over them. The air is keen and bracing, rather than soft and warm. In the valleys, the climate resembles that of the valleys of Devonshire, and the vegetation is very similar. It appears from Domesday Book that there were vineyards at that time in several parts of this county. At present the harvest is not in general earlier than in the midland counties: and although snow seldom lies long on the ground, the land is not fit for sowing in spring sooner than in many parts of England where the winters are more severe.

A considerable portion of the soil in the south-eastern part of this county is similar to that of Bagshot Heath, and not more fertile, being a loose sand and gravel, with a portion of ferruginous loam. The whole surface of the county consists chiefly of this loose sand and gravel, clay and chalk. The most fertile spots are those where all the three have been mixed in the valleys by the rivulets which run down the hills carrying the soil with them. The poor sandy soil occupies that part of the county which joins Hampshire. In the centre and towards Wiltshire lies the chalk; and along the coast, over a more solid chalky rock, is a stratum of clay, which likewise covers the western part towards Devonshire, and the northern towards Somersetshire.

The following division of the soils is given in the 'Agricultural Report of the County,' by Stevenson:—

Chalk	160,759	Acres.
Sand	85,157	„
Loam	37,746	„
Gravel	59,894	„
Miscellaneous . . .	13,427	„
Stone Brash . .	29,700	„
Clay	117,331	„
Total . . .	504,014	

Exclusive of rivers, towns, roads, &c.

The chalk hills to the west of Dorchester, and along the borders of the vale of Blackmore, are of considerable elevation, and contain several narrow vales and deep hollows. The soil on the most elevated parts of the chalk district is a thin loam over a rubbly chalk mixed with stones which lies on the solid chalk. It is most advantageous to let this soil remain as sheep-walk, the pasture being fine and short as in other downs. In the bottom of the vale of Blackmore are some extremely fertile meadows watered by the river Stour. The hills which look down upon this valley are high and bare; but the lower sides are beautifully varied with woods and fields.

The quantity of arable land throughout the county bears but a small proportion to the pasture; and greater attention is paid to the rearing of sheep and feeding of cattle than to the raising of corn. The implements of husbandry are similar to those in use in Devonshire. The wheel-ploughs are preferred in stiff and stony soils; and it is usual to put three horses before them, two abreast, and the third before the near horse; so that the furrow being turned to the right, two horses walk on the unploughed ground, and one in the furrow; they are driven by a lad. Improved ploughs have been introduced; but the majority of farmers are slow in relinquishing the instruments which they have been early accustomed to. The nine-share plough, or scarifier, has been found very useful in the light soils, and saves much time in preparing the land for the seed, as it goes over a great width and saves a ploughing.

On the larger farms the farm-houses are old buildings of, and covered with stone tiles; in the smaller they are mostly thatched with reed. Many cottages are built with mud walls composed of road scrapings, chalk, and straw. The foundation is of stone or brick, and on this the mud wall is built in regular layers, each of which is allowed to dry and harden before another is put over it. Garden walls are frequently built of these cheap materials, their top being protected from the weather by a small roof of thatch, which extends a few inches over each side. The farms are large, many having been laid together, in prosperous times, at the desire of the richer farmers, and with the concurrence of landlords, who found that the repairs on one large set of buildings are less than on many small ones.

The rent of land varies greatly. In the poor sands it is as low as 10*s.* or 12*s.* per acre; in the richer grass lands it is from 30*s.* to 40*s.*; some water-meadows let as high as 60*s.* or more. On the whole, the average rent of grass land is about 20*s.*, of old meadow about 30*s.*, the tenant paying the tithes, which seldom exceed 5*s.* per acre.

The old method of managing arable land, which is still followed by many farmers, was to fallow every fourth year on the clays, and then take two or even three crops of corn in succession. Where clover or grasses are cultivated, they are put in with the second crop, and consequently the land is not in a clean state. The most common rotation on the rich loams in the vale of Blackmore is: summer fallow—wheat—barley with grass seeds, which continue two or three years, and are then broken up again after the hay has been made, when a kind of bastard fallow succeeds, consisting of three ploughings, and the land is tolerably prepared for wheat; but it is not clean enough to prevent the necessity of a repetition of the summer fallow every sixth year at least. There is a practice with some farmers which deserves notice, as it is a step towards the system of double crops, by which the Flemish culture is rendered so much more productive than most other. It is as follows: the clover or grass of the second year is fed off early by sheep; the land is then ploughed up and sown with rape and spring tares, which give an abundant produce in autumn, on which the sheep are folded, and the land is thus well prepared for wheat. The time of sowing is about the end of May or beginning of June. A bushel of vetches and two quarts of rape-seed are the quantities sown on an acre. The crop is fed off by Michaelmas.

On the light chalky soils turnips have been very generally introduced, although they are not yet every where cultivated in the best manner.

The introduction of sainfoin on the dry chalky soils has been a great advantage, as it produces a rich fodder, requires little manure, and lasts many years. In this soil the wheat is generally sown after clover which has stood one or two years, but sometimes also after turnips or rape fed off. The folding of the land saves manure, and the vicinity of sheep downs gives an opportunity of having large folds and repeating the folding often, both before and after sowing the seed. The tread of the sheep consolidates loose soils better than the heaviest roller. The ploughing in the chalky soils is generally very shallow, because they say that the couch is thus more easily kept down; but those who plough as deep as the subsoil will permit find that their crops are more certain, especially in dry summers; and the couch is best eradicated by careful hand-picking after every ploughing.

is sown sometimes in the light soils as soon as
and before the wheat crop of that year is ripe.
tity sown is usually three bushels, and is increased
own later. In the heavier loams the wheat is
, sometimes not much before Christmas; in that
hel more is required to allow for the grains that perish, or are eaten by the birds, who are then more alert after their food. The early sown wheat is thought more subject to mildew. The seed is usually steeped and limed. When it is sown very early this precaution is frequently omitted. The average produce of wheat is from 17 to [illegible] bushels per acre.

Barley is here a more important crop than wheat. It is sown from the middle of March to the middle of May. The earliest sown is generally the best. The produce averages 30 bushels per acre. Oats are sown on the heavier and moister soils, at the rate of six bushels per acre. They think that the straw is better fodder where the oats are sown thick, but they perhaps forget that the heaviest grain is produced by sowing thin or drilling wide. Beans are planted or drilled in rows from 18 to 24 inches distant. In the rich loams of the vale the produce is considerable, from 30 to 40 bushels per acre, and often more. Turnips are generally sown broadcast, at the rate of three pounds of seed per acre; this gives an abundance of plants, which are thinned out by the hoe.

Potatoes are cultivated to a considerable extent in the rich loams about Bridport, Beaminster, Abbotsbury, &c.: they are planted in rows, or the sets are dropped in every third furrow after the plough. They are horse-hoed, and moulded up by a double mould-board plough: 24 bushels planted on an acre often produce 360. The beginning of May is the usual time of planting.

Sainfoin is sown with a spring crop: four bushels of seed are required for an acre. It is cut before the blossom is fully expanded and made into hay, which is excellent fodder for sheep in winter. After several years, when it begins to go off, it is ploughed up, and the land sown with oats. It is often advantageous to pare and burn the land after sainfoin; but as this practice is generally forbidden in leases, however advantageous it may be occasionally, a method is adopted which equally destroys the vegetable matter without burning the soil. This is to rib the land; that is, to plough furrows with intervals, and do this again across the first ribs; the sods are thus cut in squares, and the harrows passing over them leave the roots in the form of matted tufts, which are burnt, and the ashes spread to enrich the ground. A regular paring and burning would be much better, both for the landlord and the tenant. Sainfoin does not produce much the first year after it is sown, and consequently many farmers sow hop-clover with it, which being an annual gives a produce the first year, and fills the intervals of the sainfoin, which is in perfection the second. The land which has borne sainfoin for some years is not sown again with the same crop till after an interval of [illegible] or 12 years at least.

Hemp is cultivated to some extent in the richest soils which contain a considerable proportion of sand, and are too light for beans. The land is prepared by ploughing it three times; first, before winter, when it is richly dunged; and next in spring, when it is well harrowed. The direction of this second ploughing is across the former furrows, whenever it can conveniently be done. The third ploughing is in May, when the ground is laid as level and smooth as possible by means of the heavy hoe or hack. Two bushels of seed are then sown evenly over it, and slightly harrowed in. A slight rolling of the ground, if it is very light, finishes the operation. Hemp completely keeps down weeds by the shade of its leaves; and the land, if well richly manured for this crop, is in good order after it for any other which may suit it. An acre of good hemp produces 800 lbs. of fibre, a middling crop is 600 lbs., and a poor one 450 lbs. The chaff of the hemp makes an excellent manure.

Flax is likewise cultivated in the sound deep loams which have been gradually enriched by manuring the preceding crops. If the dung were not thoroughly incorporated the soil it would make the flax coarse and uneven. The soil must be pulverized to a considerable depth, and must also be very free from weeds. Two bushels of seed are sown on an acre. The best seed comes from Riga; the time of sowing is the middle of April. Clover seed is sometimes sown among it. It should be most carefully hand-weeded as soon as the plants can be distinguished from weeds: after this the flax and clover will keep them down. The produce is about six to eight bushels of seed, each of which gives a gallon and a half of oil, and from 600 to 900 lbs. of flax fit for spinning.

The grass lands and pastures occupy about three-fifths of the surface of the county, or above 390,000 acres, of which about 6000 are irrigated, chiefly in the sandy and chalky districts. The meadows along the vale of Blackmore are extremely rich, and produce much hay, which is used to feed the dairy cows in winter. The upland meadows are well managed and frequently dressed with lime and dung. Many sheep which feed on the downs in summer are wintered in the vales. The pastures on the hills are not sufficiently rich to fatten oxen, but are well adapted to feed dairy cows. The Dorset butter is in good repute in London and Portsmouth for ship provision as well as domestic use; it is not so salt as the Irish, and is therefore preferred, although the Irish is richer when it is of the best quality. Dorset salt butter, when well washed, is very commonly sold in London for fresh butter. The best cow pastures will keep a cow on two acres during the whole summer; of the inferior pastures three or four acres are required for each cow. The cows are frequently let to a dairyman at the rate of 8*l.* or 10*l.* per cow for the season. This is a great convenience to a farmer who has arable land to attend to, and is thus relieved from all care but that of providing pasture for the cows, and cows for the pasture. The cows eat little else but straw in winter, and very little hay is made in proportion to the extent of grass land. The farmer finds a house for the dairyman and his family to live in, allows him to keep as many pigs and poultry as he chooses, and a mare to carry the butter to market. The mare generally produces a foal, which is part of the dairyman's profit. The bargain is from Candlemas to Candlemas. A notice to quit given by either party before All Saints' Day is considered sufficient, and the dairyman quits the premises at Candlemas. The butter is made from the cream, and the skimmed milk is made into cheese. The milk is skimmed only once in twenty-four hours. The Dorsetshire skim milk cheese is preferred on account of streaks of blue mould which frequently run through it. These streaks are said to be produced by breaking the curd again after the cheese has been pressed, and sprinkling wheat flour over the fragments; it is then replaced in the vat and pressed again.

A few calves are annually reared to keep up the number of the cows: the calves have milk for three months, and the dairyman receives an allowance of a fourth part of the sums which he pays for a cow for each calf so reared. February is the usual time for weaning calves, because in May when the grass is abundant they can be turned out to advantage and get strong before winter.

The cows kept for the dairy in the vales are chiefly of the Devonshire breed, but the pasture on the hills not being sufficiently good for them, another mixed breed is preferred there, which has longer horns, and seems to be a cross between the old long horns and the Gloucestershire, or perhaps the short horn. The colour is generally brindle on the sides with a white stripe down the back and white under the belly. They are hardy, and in general good milkers on moderate pasture. Crosses with Alderney cows are occasionally met with, but chiefly in gentlemen's dairies on account of the rich cream which they give. Dairymen prefer quantity of milk and larger cows.

The Dorset sheep are noted as a profitable breed to those who rear house-lambs for the London market. They are horned and well formed, straight in the carcase, deep in the body, and the rump is larger than in other sheep; the breast points forward, the face is thin, the horns are thin and bend rather backward, the tail is usually left long. They give much milk and fatten their lambs better than any other breed. There is another very small breed in the Isle of Purbeck, and near Weymouth, of which the flesh is in repute with epicures: they weigh about 10 lbs. a quarter, and are generally sold by the quarter like early lamb, and not by the pound. Some consider them as the real and original Dorsetshire breed. They resemble the small forest sheep formerly found on all the commons of the forest of Windsor, and on Bagshot-heath, the mutton of which was in equal repute as Bagshot mutton. The wool is fine, but the fleece does not weigh above 1½ or 2 pounds on an average. The South-down breed is very generally found in Dorsetshire, and suits the pasture and climate better than the Leicester. The management of Dorset ewes, when they are intended for producing early lambs, is as follows:—At four years old when the ewes have had two or three lambs, their lambs are weaned in April, and the ewes are kept on water meadows and the richest pastures, without being ever folded, that they may be in condition to take the ram in May and June, and be forward in lamb by Michaelmas, when they are almost invariably sent to Weyhill fair, and sold to dealers who drive them towards London and sell them to those who fatten early house-lamb, and who make a very considerable profit on them, if they understand how to manage the ewes to the best advantage. The Dorset ewes frequently have twin lambs, but the single are preferred for fattening. When there are twins, one of them is either killed immediately or given away. The average quantity of wool on a Dorset sheep is 3½ pounds.

The following fairs are established in the county; but several of them are no longer cattle fairs, but mere holydays: Abbey Milton, Tuesday after July 25; Abbotsbury, July 10; Allington, July 22; Beaminster, September 19; Blandford, March 7, July 10, and November 8, a large sheep fair; Bridport, April 6, fat beasts, cows, calves, bulls; October 11, cattle and pedlery; Broadway, Wednesday before September 18; Broad Windsor, Trinity Monday; Cerne Abbas, Midlent Monday, for barren cows, and cows with calf, Holy Thursday, October 2; Corfe Castle, May 12, October 29 for hogs and toys; Cranbourne, August 24, December 6, cheese and sheep; Dallwood, first Wednesday before August 21; Dorchester, February 14, cows and calves, barreners, Trinity Monday, cows and horses; July 6, sheep and lambs, August 6, sheep, lamb, wool, leather; Emmorgreen, Tuesday before Holy Thursday; Evershot, May 12, cattle and toys; Farnham, August 21, cheese and toys; Frampton, March 4, August 1, September 4; Gillingham, Trinity Monday, cattle, September 12, toys; Hermitage, August 26, horses; Holtwood, August 6, horses, sheep, toys; Lyme Regis, February 13, October 2; Leigh, March 25, May 1, September 3; Lambert Castle, Wednesday before June 24, cattle; Maiden Newtown, March 9, May 4, cows, &c.; Martin Town, November 22, 23, sheep, cows, and horses; Milborne St. Andrews, November 30, sheep, cows, &c.; Melbury, Whitsun Monday; Ower Moigne, October 10, pigs and toys; Poole, May 1, November 2, free mart for toys; Pamphill, July 7, October 29; Piddle Town, Easter Tuesday, October 29, cows and pigs; Portland, November 5, sheep; Shaftesbury, Saturday before Palm Sunday, June 24, November 23, cattle; Sherborne, Wednesday before Holy Thursday, cattle, July 18, wool, cattle, horses, July 26, lambs, October 13, wool and cattle; Shroton, September 25, sheep, cows, horses; Stalbridge, May 6, September 4, beasts; Stockland, July 12, cattle; Sturminster, May 12, October 24, fat cattle; Sydling, December 6, cattle; Toller Down, May 29, sheep, 30, toys; Wareham, April 17, cattle, July 5, September 11; Wimborne, Friday before Good Friday, cattle and horses, September 14, cattle, horses, sheep, cheese; Woodbury Hill, near Bere Regis, September 18, and five following days, cattle, horses, hops, cheese, cloth, &c.; Woodland, July 9, horses and cheese; Woolbridge, May 14, cows, pigs, toys; Yetminster, First Tuesday after April 26, October 4.

Divisions, Towns, &c.—The county of Dorset previous to the year 1740, was thus divided. There were five more considerable parts, or as they were termed, 'divisions,' which took their names from the towns of—I. Blandford, II. Bridport, III. Dorchester, IV. Shaftesbury, and V. Sherborne. These were further subdivided as follows:—

I. The Blandford division contained the boroughs of (1) Blandford, (2) Corfe Castle, (3) Poole, and (4) Wareham: the hundreds of (1) Bere Regis, (2) Coombsditch, (3) Hasler, (4) Hundreds Barrow, (5) Pimperne, (6) Rowbarrow, (7) Rushmore, and (8) Winfrith: and the liberties of (1) Bindon, (2) Dewlish, (3) Owermoigne, and (4) Stowborough.

II. The Bridport division contained the boroughs of (5) Bridport, and (6) Lyme Regis; the hundreds of (9) Beaminster, (10) Beaminster Forum, and Redhove, (11) Eggerdon, (12) Godderthorn, and (13) Whitchurch Canonicorum: and the liberties of (5) Broad Windsor, (6) Frampton, (7) Loder and Bothenhampton, and (8) Poorstock.

III. The Dorchester division contained the boroughs of (7) Dorchester, (8) Weymouth, and (9) Melcomb Regis: the hundreds of (14) Culliford-tree, (15) George (St.), (16) Piddletown, (17) Tollerford, and (18) Uggescomb, or Uggescombe: and the liberties of (9) Fordington, (10) Piddlehinton, (11) Portland, (12) Preston and Sutton Poynts, (13) Waybaiouse, and (14) Wyke Regis and Elwell.

IV. The Shaftesbury division contained the borough of (10) Shaftesbury: the hundreds of (19) Badbury, (20) Cogdean, (21) Cranbourne, (22) Knolton, (23) Loosebarrow, (24) Sixpenny Handley, (25) Up Winbourne Monkton, and (26)

Wimbourne St. Giles: and the liberties of (15) Alcester, (16) Gillingham, and (17) Sturminster Marshall.

V. The Sherbourne division contained the hundreds of (27) Brownshal, (28) Buckland Newton, (29) Cerne, (30) Modbury, (31) Redlane, (32) Sherbourne, (33) Sturminster Newton Castle, (34) Totcomb, (35) Whiteway, and (36) Yateminster: and the liberties of (18) Alton Pancras, (19) Halstock, (20) Minterne Magna, (21) Piddletrenthide, (22) Ryme Intrinseca, (23) Sydling St. Nicholas, and (24) Stour Provost. Cerne, Totcomb, and Modbury hundreds are for some purposes united: and the liberty of Minterne Magna is by some given as united with that of Piddletrenthide.

The boroughs in the above list are not all parliamentary.

Since 1740 a new arrangement of the county has been adopted. The five divisions have been increased to nine, as follows:—

I. The Blandford north division (population 9198) contains the borough of (1) Blandford; the hundreds of (1) Coombsditch, (2) Pimperne, (3) Rushmore; and the liberty of (1) Divelish, or Dewlish.

II. The Blandford south division (population 15,139) contains the boroughs of (2) Corfe Castle, and (3) Wareham; the hundreds of (4) Beer, or Bere Regis, (5) Hundredsbarrow, (6) Hasilor or Hasler, (7) Rowbarrow, (8) Winfrith; and the liberties of (2) Bindon, (3) Owermoigne or Overmoygne, and (4) Stoborough, or Stowborough.

III. The Bridport division (population 29,585) contains the boroughs of (4) Bridport, and (5) Lyme Regis: the hundreds of (9) Beaminster, (10) Beaminster Forum and Redhone or Redhove, (11) Eggerton or Eggardon, (12) Godderthorn, and (13) Whitchurch Canonicorum; and the liberties of (5) Broad Windsor, (6) Frampton, (7) Loder, or Lothers, and Bothenhampton, and (8) Poorstock.

IV. The Cerne division (population 8517) contains the hundreds of (14) Buckland Newton, (15) Cerne, (16) Modbury, (17) Totcomb (which three are united), and (18) Whiteway; the liberties of (9) Alton Pancras, (10) Piddletrenthide, and (11) Sydling St. Nicholas.

V. The Dorchester division (population 32,039) contains the boroughs of (6) Dorchester, (7) Melcomb Regis, united with (8) Weymouth; the hundreds of (19) Cullifordtree, (20) George, or St. George, (21) Tollerford, (22) Piddletown, (23) Uggscombe; and the liberties of (12) Fordington, or Forthington, (13) Piddlehinton, (14) Portland, (15) Sutton Points, or Poynts, (16) Wabyhouse, or Waybaiouse, and (17) Wyke Regis and Elwell.

VI. The Shaftesbury, or Shaston, east division (population 21,012) contains the hundreds of (24) Badbury, (25) Cogdean, (26) Cranbourne (part of), (27) Knolton, or Knowlton, (28) Loosebarrow, (29) Monkton up Wimbourne, (30) Sixpenny Handley (part of), and (31) Wimbourne St. Giles.

VII. The Shaftesbury, or Shaston, west division (population 12,510) contains the borough of (9) Shaftesbury; parts of the hundreds of (26) Cranbourne, and (30) Sixpenny Handley given above; and the liberties of (18) Alcester, and (16) Gillingham.

VIII. The Sherbourne, or Sherborne, division (population [illegible]) contains the hundreds of (32) Sherbourne, and (36) Yateminster, or Yetminster; and the liberties of (20) Halstock, and (21) Ryme Intrinseca.

IX. The Sturminster division (population 11,219) contains the hundreds of (34) Brownshal, (35) Redlane, and (33) Sturminster Newton Castle; and the liberty of (22) Stour or Stower Provost.

The hundreds in the above list, it will be seen, are the same as those in the foregoing: but the borough of Poole is here omitted, being considered as a county of itself (population 6459), and the liberties of Minterne Magna and Sturminster Marshall are respectively included in the liberty of Piddletrenthide and the hundred of Cogdean.

The population given above is from the census of 1831.

The following are market-towns. Dorchester, the county town and a municipal and parliamentary borough, on the river Frome; population, in 1831, 3033; the parliamentary boroughs of Bridport on the Brit, population in 1831, 4242; Lyme Regis on the Sea, population in 1831, 2621; Melcomb Regis on the Sea, population in 1831, united with that of Weymouth, 7655; Poole, on Poole harbour, population in 1831, 6459: Shaftesbury, on the border of the county adjacent to Wiltshire, population in 1831, 3061; and [illegible] between the Piddle and the Frome, population [illegible], and the municipal borough of Blandford Forum, on the Stour, population in 1831, 3109. Of these places, and of the market-towns of Beaminster on the Brit, near its source, population in 1831, 2968, Sherbourne on the Yeo, population in 1831, 4261, and Wimbourne Minster, on the Allen, population in 1831, 4009, an account is given elsewhere. [BEAMINSTER, BLANDFORD, BRIDPORT, DORCHESTER, LYME, POOLE, SHAFTESBURY, SHERBOURNE, WAREHAM, WEYMOUTH, WIMBOURNE MINSTER.]

Of the other market-towns, Cerne Abbas, Cranbourne, Stalbridge, and Sturminster Newton, as well as of Corfe Castle, a disfranchised borough, and Milton Abbas, the market of which has been discontinued of late years, an account is subjoined.

Cerne Abbas is on the little river Cerne, a feeder of the Frome, and in the combined hundreds of Cerne, Totcomb, and Modbury, 7½ miles from Dorchester. The parish comprehends 3010 acres (a large proportion being downs or sheep-walks), and had in 1831 a population of 1209. Cerne is in a pleasant vale, surrounded by steep chalk hills. It is a very small town, with little trade except what is transacted at its weekly market (held on Wednesday, for corn, butchers' meat, and provisions, and tolerably well frequented), and at its three yearly fairs. The town was formerly notorious for the number of persons engaged in smuggling. Petty sessions for the division are held here There was formerly at Cerne a Benedictine abbey of great antiquity, rebuilt and endowed in the tenth century by Ailmer, or Ælward, or Ægilward, whom Leland calls earl of Cornwall and Devon. Its revenues were valued, at the dissolution, at 623*l.* 13*s.* 2*d.* gross, or 515*l.* 17*s.* 10*d.* clear yearly value. All that remains of the abbey is a stately, large, square, embattled tower or gate-house, now much dilapidated. There is an antient bridge, once an appendage of the abbey, and a more modern bridge; both are of stone. A mansion-house, called the Abbey House, and chiefly built from the ruins of the abbey, contains incorporated in it some remains of the more antient abbey-house, built by Abbot Vanne in the fifteenth century. Several beautiful overflowing wells still remain, probably the work of the abbots, drawing their sources through subterranean channels from the spring of St. Augustine. The parish church was built by one of the later abbots for the use of the parishioners. It is a handsome building, in the perpendicular style of Gothic architecture, with a fine tower, which has octagonal turrets and pinnacles. The living is a vicarage, of the annual value of 81*l.*, with a glebe-house. There is a meeting-house for Independents. By the education returns of 1833, it appears that there were in Cerne 1 infant and daily school, with about 80 children, partly supported by the clergyman of the parish; 9 day-schools, with nearly 220 children; and 2 Sunday-schools, with nearly 150 children (the larger school connected with the church), supported by voluntary contributions.

On the southern slope of 'Trendle Hill,' a short distance north-west of the town, is the outline of a remarkable figure of a man bearing a club, cut into the chalk; the height of the figure is about 180 ft.; the outlines are about 2 ft. broad There are various traditional and conjectural statements respecting the origin of this figure. It is repaired by the townspeople about once in seven years. On the south point of the hill, over the giant's head, has been an antient fortification, and on the north point a barrow. There are several barrows on the surrounding hills. Cerne was injured by the Irish troops in the king's service in the great civil war A.D. 1644, and by a storm of wind A.D. 1731.

Cranbourne is a small market-town, situated in a fine champaign country, on the little river Allen (a feeder of the Stour) near its head. It is in the hundred of Cranbourne, 93 miles from London. The parish is the largest in the county, comprehending 13,730 acres, and had, in 1831, a population of 2158, chiefly agricultural. No manufactures are carried on. The market, which is small, is on Thursdays; there are two fairs and one great cattle market in the year. The houses are in general neat and well built About A.D. 980 a monastery for Benedictines was founded here by Ailward de Meau or Snew, of the family of Edward the Elder. This either was originally, or subsequently became, an abbey; but the abbot and most of the monks being removed to Tewkesbury, it was reduced to be a simple priory and a cell of Tewkesbury. Some time after the Dissolution, the present manor-house was built on the site and from the materials of the priory; it is the property of the Marquis of Salisbury, who takes the title of viscount from this town. The parish church, formerly the priory church, which is one of the oldest and largest in the county, will accommodate 1000 persons. The tower is in the perpendicular style: the church has portions of an earlier character, and a door under the north porch is Norman. There is a rich wood pulpit on a stone base. The living is a vicarage, united with the chapelries of Verwood and Boveridge, of the yearly value of 151*l.*, with a glebe-house. There were in the parish, in 1833, 6 infant or dame schools, with 60 children; 4 day-schools, with 206 children; and 4 Sunday-schools, with 402 children.

North-west of the town is a large waste extending into Wiltshire: it was formerly a free warren or chase, once possessed by the house of Gloucester, and till lately by Lord Rivers, who had a right to keep deer all over it. It is covered chiefly with hazels and blackthorns, with a few timber trees. It has lately been disfranchised as a chace by act of parliament. It was very pernicious to the neighbouring farms, and was the occasion that few turnips were sown, as the deer made great depredations on that crop and could not be prevented. The deer are now destroyed.

Stalbridge is in the hundred of Brownshal, about two miles from the Cale (which falls into the Stour), 112 miles from London. The parish contains 4900 acres (including the tithings of Gomershay, Thornhill and Weston), and had in 1831 a population of 1773, of which rather more than a third was agricultural. The market is on Tuesday, and there are two cattle fairs in the year. The cattle market is held in alternate weeks. According to Hutchins's *History of Dorsetshire* (2nd edit. 1813, vol. iii., p. 239), the stocking manufacture is carried on here.

The town is irregularly laid out: in the market-place is an antient cross twenty-two feet high, or, including the base of three steps, thirty feet. There is a dissenting meeting-house. The church is a large antient structure, with a high embattled tower at the west end. The living is a rectory of the yearly value of 888*l.* with a glebe-house. There were in the parish in 1833, one 'national' day-school, supported by subscription, with 115 children, three Sunday-schools, with 308 children, besides several dame schools. Stone is quarried in the parish, and used for building and roofing.

Sturminster or Stourminster Newton Castle is in the hundred of the same name, in a rich vale on the bank of the Stour, 109 miles from London. The town is divided into two parts: Sturminster (by far the largest) lies on the north side, Newton Castle lies on the south side of the river. The two are connected by a bridge. The parish contains 4530 acres, and had in 1831 a population of 1831, of which about two-fifths are agricultural. The market is on Thursday for corn and on Saturday for butchers' meat: the cattle market is once a fortnight: there are two fairs in the year for cattle, &c.

The town is irregularly built; the market-house is a very antient building, near which is the base of a cross, on four steps. The church is a large building with an embattled tower of moderate height. The living is a vicarage of the yearly value of 712*l.* In Newton Castle is an antient fortification, probably of the Saxon time, in the form of a Roman D, surrounded on the south-west side and part of the east side by a vallum and ditch: there are the remains of some antient buildings near it. There were in the parish in 1833, one infant school with nearly 170 children, one day-school with 60 or 70 boys, and one Sunday-school of 140 children, all supported by subscriptions or donations: and five other day-schools with about 50 children.

Corfe Castle, a disfranchised borough, is near the centre of the 'isle' or rather peninsula of Purbeck. It is included in Blandford south division, and is 116 miles from London. The borough and parish boundaries are the same, and include an area of 9860 acres: there were in 1831 1712 inhabitants.

This town, which is near the castle, consists of two streets, of mean looking houses, built of stone and covered with tiles. The inhabitants are partly engaged in the marble and stone quarries, and clay works in the neighbourhood. The church is a large and very antient fabric, with many portions of Norman and early English architecture: it has an embattled and pinnacled tower, a large porch, and two buildings, one on each side of the church, formerly chapels, but now applied to other purposes. The church was much damaged in the great civil war when the castle was attacked A. D. 1646.

The castle was built, probably in the tenth century, by King Edgar. Its stateliness and strength, being situated on a high hill, caused it to be regarded in former times as a fortress of great importance. It was sometimes the residence of the West Saxon princes. Here King Edward the Martyr was assassinated by his step-mother, Elfrida (A. D. 978 or 981). King John in his war with the barons deposited his regalia here for security: and Edward II. when he fell into the hands of his enemies was for a time imprisoned here. In the great civil war Corfe Castle was stoutly defended for the king by Lady Bankes, wife of Lord Chief Justice Sir John Bankes, the owner of it, with the assistance of her friends and retainers, and of a governor sent from the king's army. It was however taken by the parliamentarians by treachery, February, 1645-46, and dismantled.

The ruins are extensive, and from their high situation form a very striking object. The castle is separated from the town by a ditch, now dry, which is crossed by a bridge of four very narrow high arches. 'The vast fragments of the king's tower,' says Mr. Hutchins, 'the round towers, leaning as if ready to fall, the broken walls and vast pieces of them tumbled into the vale below, form such a scene of havock and desolation as strikes every spectator with horror and concern. The plenty of stone in the neighbourhood, and the excellency of the cement, harder to be broken than the stones themselves, have preserved these prodigious ruins from being embezzled and lessened.'

Corfe Castle was a borough by prescription previous to the reign of Elizabeth, who bestowed on it a charter; but the privileges granted by this charter were vested rather in the lord of the manor than the burgesses. Another charter was granted by Charles II. Corfe Castle never sent representatives to the House of Commons till the reign of Queen Elizabeth, and was disfranchised by the Reform Act. The parish is now included in the parliamentary borough of Wareham.

The living of Corfe Castle is a rectory, of the yearly value of 685*l.*, with a glebe-house. There were in the parish in 1833, three infant or dame schools with 65 children; five day-schools with above 250 children; four of these schools were chiefly supported by subscriptions and donations; and three Sunday-schools with above 200 children. One of the day-schools (supported by dissenters) had a lending library attached.

Milton Abbas, or Abbot, is said to derive its name (which is a contraction of Middleton Abbot) from its situation near the centre of the county. It is in the hundred of Whiteway, in a deep vale inclosed by steep chalk hills on the north and south side, 111 miles from London. The parish comprehends 2420 acres, and had in 1831 a population of 846 persons: above three-fourths of the population are agricultural. Its market and fairs have been given up.

Here was an abbey founded by King Athelstan, which alone gave any importance to the town, which was in former times more considerable than now. The abbey has been numbered among the mitred abbeys, but erroneously. Its value at the dissolution was 720*l.* 4*s.* 1*d.* gross, or 578*l.* 13*s.* 11*d.* clear. The buildings of the abbey were preserved for a long time, but were gradually pulled down, chiefly to be replaced by more modern erections. The hall yet remains, a noble and magnificent old room: part of the mansion of Milton Abbey, belonging to the Damer family, which enjoyed for some time the title of earl of Dorchester, now extinct. Milton has an almshouse and a grammar-school. The conventual church was for some time the parish church, but a late earl of Dorchester having built a new parish church, converted the old one into a private chapel. It consists of the choir, transepts, and tower of the old abbey church: the choir is chiefly of early decorated character, the transepts and tower perpendicular. The general appearance of this edifice is very fine.

The living of Milton Abbas is a vicarage, of the yearly value of 127*l.*, with a glebe-house. In 1833 the parish contained seven day-schools with about 70 children, and two Sunday-schools with about 50.

Markets were formerly kept at Abbotsbury, Bere Regis, Evershot, Frampton, and other places. The inhabitants of Abbotsbury, which is near the western end of the Chesil Bank, are much engaged in the mackerel fishery. A large abbey of Benedictines was founded here in the eleventh century by Orc, steward of King Edward the Confessor. Very little of the monastic buildings now remain: the conventual church is, except the porch, entirely demolished.

Near Abbotsbury is an antient chapel of St. Catherine, which, from its elevated situation, is used as a sea-mark. Swannage, or Swanwich, near Corfe Castle, is a place of some resort as a bathing place.

Divisions for Ecclesiastical and Legal purposes.—In the earlier period of the Ecclesiastical constitution of England, Dorsetshire was included in the bishopric of Dorchester in Oxfordshire, a see founded by Birinus, first bishop of the West Saxons, about A.D. 626; and afterwards removed to Winchester. In the year 705 when Ina, king of Wessex, divided his kingdom into dioceses, Dorsetshire was comprehended in that of Sherborne, from which place the see was removed, about the middle of the 11th century, to Sarum. Upon the erection of the see of Bristol, A.D. 1542, Dorsetshire was transferred to the new diocese, of which it constituted the chief part, and it continued to be so, until transferred back by the late act to the diocese of Salisbury. Dorsetshire was an archdeaconry before it was transferred to the see of Bristol. It is subdivided into five rural deaneries, Bridport, Dorchester, Pimperne, Shaftesbury, and Whitchurch Winterbourne. While the county was in the diocese of Bristol the bishop held his triennial, and the archdeacon his annual visitations at Bridport, Dorchester, Blandford, Shaftesbury, Cerne Abbas, or Whitchurch: this arrangement we presume will be continued. The number of benefices it is difficult to give: Hutchins gives the parishes at 250; of these some are parochial chapelries; others, though separate and independent in other respects, are united under one incumbent.

This county is included in the Western circuit. The assizes were antiently held at Sherbourne; sometimes though rarely at Shaftesbury, but generally, especially in latter times, at Dorchester, where they may be considered as now fixed. The shire-hall and county gaol are at Dorchester. The Epiphany quarter sessions are held at Blandford, the Easter at Sherbourne, the Midsummer at Shaftesbury, and the Michaelmas at Bridport.

Before the passing of the Reform Act, twenty members were returned to the House of Commons from Dorsetshire, viz. two for the county, four for the united boroughs of Weymouth and Melcomb Regis, and two each for the boroughs of Bridport, Corfe Castle, Dorchester, Lyme, Poole, Shaftesbury, and Wareham. By the Reform Act the number has been reduced to fourteen, viz., three for the county, two each for the boroughs of Bridport, Dorchester, and Poole, and Weymouth, united with Melcomb Regis; and one each for the boroughs of Shaftesbury, Lyme Regis, and Wareham. Corfe Castle was disfranchised and included in the neighbouring parliamentary borough of Wareham. The chief place of election for the county is Dorchester: the polling stations are Beaminster, Blandford, Chesilton (in the Isle of Portland), Dorchester, Shaftesbury, Sherbourne, Wareham, and Wimbourne.

History and Antiquities.—This county was, in the earliest period noticed by history, inhabited by a people whom Ptolemy calls Δουροτριγες Durotriges, a name which Mr. Hutchins (after Camden) derives from the British words Dwr water and Trig an inhabitant, and interprets to mean dwellers by the water side. According to Asser Menevensis the Britons called this people Dwr Gwyr: the Saxons called them Doꞃꞅeꞇꞇan (Dorsettan,) whence the modern name of the county. The name Dorsettan is equivalent in meaning to the antient British name, given in a Greek form by Ptolemy. These Durotriges appear to have been of Belgic race. Upon the conquest of South Britain by the Romans, Dorsetshire was included in Britannia Prima.

Of this early period of our history there are several remains in various camps and earth works, stone circles, cromlechs, and barrows. In the north-eastern part of the county and the adjacent part of Wiltshire, are several embankments with ditches: they all run in a winding and irregular manner, mostly from south-east to north-west, having the ditch on the north-east side. Vernditch, which has given name to a part of Cranbourne chace, is of these, Grimsditch is another. On the right of the road from Cerne Abbas to Calstock and in other parts of the county are little banks, crossing one another in all kinds of angles: they are made of flints covered with turf. Neither their age nor their use seems to be known.

There are several Roman camps in the county. Mr. Hutchins enumerates twenty-five; and the walls and atre of Dorchester, and the coins and pavements re, are monuments of the same victorious people. There were at least two Roman stations in the county, viz. Durnovaria, [Itin. Antonini,] or Δουνιον, Dunium [Ptolemy], Dorchester; and Vindocladia or Vindogladia, Vindelia in Richard of Cirencester, which some are disposed to fix at Wimbourne, others more probably at Gussage, between Blandford Forum and Cranbourne. To these Dr. Stukely would add a third, Ibernium, (mentioned by the anonymous Ravennas,) which he fixes at Bere Regis. Several places in the confused and barbarous list of names given by Ravennas, are conjectured by Baxter to be in Dorsetshire.

The Icknield or Ecknield way enters the county at its western extremity, coming from Hembury Fort [DEVONSHIRE], and runs east by south to Dorchester, near which it is very perfect, high and broad, and paved with flint and stone: from Dorchester it runs by Sheepwick and Sturminster Marshall, and the Gussages into Wiltshire. In this part it is called Ackling dike. Its passing near the Gussages gives support to the conjecture of those who fix Vindogladia at one of them. The remains of a Roman road may be traced on the south-west side of the Frome, leading from Dorchester in a north-west direction as far as Bradford Peverel, and Stratton, soon after which it disappears: another road may be traced from Dorchester, on the other bank of Frome, parallel to the former road, and uniting with it at Stratton; a third runs south from Dorchester in the direction of Melcomb Regis; and there are traces of several others.

When the Saxons established their octarchy, Dorsetshire was included in the kingdom of Wessex; and even after the West Saxon princes acquired the sovereignty of England, they resided occasionally in this county. Ethelbald and Ethelbert, the elder brothers of Alfred the Great, were buried at Sherbourne; and Ethelred I., another brother of the same prince, at Wimbourne.

In the invasions of the Danes this county suffered severely. Egbert, king of Wessex, fought a battle with them at Charmouth, near the western extremity of Dorsetshire, A.D. 833. Seven years afterwards his son Ethelwolf fought a second battle with them at the same place. In A.D. 876 they made themselves masters of Wareham, where they were besieged by Alfred, who obliged them to quit that place the next year, when 120 of their vessels were wrecked at Swanage. In A.D. 1002, Sweyn, king of Denmark, in his invasion of England, destroyed Dorchester, Sherbourne, and Shaston or Shaftesbury.

Throughout the middle ages, few events of historical interest connected with the county occur. The contest of the Roses little affected this part of the kingdom. The towns on the coast were flourishing, as appears from the following list of the vessels which they furnished to the fleet of Edward III. at the siege of Calais, A.D. 1347: Weymouth, 20 ships and 264 mariners, or, according to Hackluyt, 15 ships and 263 mariners; Lyme, 4 ships, 62 mariners; Poole, 4 ships, 94 mariners; Wareham, 3 ships, 59 mariners. To judge of the comparative importance of these armaments, it must be remembered that Bristol furnished only 22 ships and 608 mariners, and London 25 ships and 662 mariners; so that Weymouth furnished only 2 vessels less than Bristol, and only 5 less than London: they were, however, more weakly manned and probably smaller. To the fleet of the lord high admiral (Howard of Effingham) at the time of the armada, A.D. 1588, the county furnished 8 vessels (3 of them volunteers): the aggregate tonnage of 7 of these was 560 tons, and they carried 290 men; the tonnage of the eighth vessel is unknown; it carried 50 soldiers. The second engagement of the English fleet with the armada was off Portland Bill.

In the civil war of Charles I. the gentry were mostly for the king; but the people of the towns, where the clothing trade was then carried on, and of the ports, were for the parliament. In the beginning of the war, Sir Walter Earle and Sir Thomas Trenchard, partisans of the parliament, possessed themselves of Dorchester, Weymouth, Portland, Lyme, Wareham, and Poole, while Sherbourne Castle, Chidcock Castle, and Corfe Castle were garrisoned by the king. The parliamentarians always retained Lyme and Poole, which were fortified; but the other towns, being open, fell into the hands of whichever party was master of the field. In March, 1642-3, Sir William Waller marched into the county with two regiments of horse, but did little; and the earl of Carnarvon entering the county with a body of royalists, took Dorchester and Portland, and raised the siege of Corfe Castle which the parliamentarians had formed. Several engagements took place in the county at a later period of the contest, but they were of little moment. Corfe Castle held out for the king till 1645-6. The year 1645 was distinguished by the rising of the club men in the counties of Dorset, Wilts, and Somerset; their object was to defend this part of the country from the outrages of both parties. Their assembling excited the jealousy of the parliamentarians, whose superiority was now established. Cromwell defeated a considerable body of them at Hambleton hill, and other bodies were persuaded to disperse.

STATISTICS.

Population.—Dorsetshire is principally an agricultural county, ranking the seventeenth in this respect. Of 37,961 males twenty years of age and upwards, inhabitants of Dorsetshire in 1831, there were 16,765 engaged in agricultural pursuits, and only 730 in manufactures or in making manufacturing machinery. Of these latter 300 were employed in the manufacture of hemp into twine and sailcloth, chiefly at Bridport; 80 were employed in the woollen manufacture, chiefly at Lyme Regis; about 40 in silk, mostly at Shaftesbury; there were a few glove-makers at Cerne-Abbas; and wire button-making still gives employment to a few hands.

The following summary of the population, as taken in 1831, shows the number of the inhabitants and their occupations in each division of the county.

DIVISIONS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total.	Males twenty years of age.
Blandford, North	1,095	1,319	9	95	891	259	169	2,963	3,126	6,089	1,341
Blandford, South	2,415	2,097	19	66	1,274	476	347	6,251	6,563	12,814	3,032
Bridport	4,703	5,178	44	170	2,663	1,528	987	12,280	13,063	25,343	6,048
Cerne	1,360	1,844	14	56	1,179	486	179	4,186	4,331	8,517	2,123
Dorchester	3,969	4,545	57	190	2,041	1,025	1,479	10,466	10,895	21,361	5,141
Shaston, East	4,003	4,407	89	120	3,307	598	502	10,225	10,787	21,012	5,179
Shaston, West	1,736	1,890	30	44	1,271	302	317	4,569	4,880	9,449	2,226
Sherborne	1,206	1,506	19	44	959	322	225	3,363	3,616	6,979	1,659
Sturminster	2,129	2,300	12	71	1,248	606	446	5,607	5,612	11,219	2,690
Blandford, town	502	613	..	6	92	343	178	1,406	1,703	3,109	749
Bridport, borough	625	794	10	43	..	478	316	1,966	2,276	4,242	971
Dorchester, borough	420	558	2	11	27	333	198	1,481	1,552	3,033	877
Lyme Regis, borough	423	542	7	55	53	257	232	1,161	1,460	2,621	596
Shaftesbury or Shaston, borough	516	566	11	30	72	367	127	1,484	1,577	3,061	711
Sherborne town	782	985	7	15	180	559	246	1,809	2,266	4,075	945
Wareham, borough	494	517	8	29	72	182	263	1,666	1,259	2,925	599
Weymouth and Melcombe Regis, borough	1,380	1,769	10	135	10	847	912	3,323	4,332	7,655	1,604
Poole, town and county	1,313	1,426	11	76	6	645	775	2,884	3,575	6,459	1,264
Totals	29,307	33,614	319	1,260	14,601	10,106	8,907	76,536	82,716	159,252	37,961

The population of Dorsetshire each time the census was taken was:—

	Males.	Females.	Total.	Incr. per cent.
1801	53,667	61,652	115,319	
1811	57,717	66,976	124,693	8.13
1821	68,634	75,865	144,499	15.88
1831	76,536	82,716	159,252	10.22

Showing an increase between the first and last periods of 43,933, nearly 38 per cent., which is 17 per cent. below the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates of

		£.		s.	d.	
1801	were	64,721,	which was	11	2	for each inhabitant.
1811	"	109,304	"	17	6	"
1821	"	85,647	"	11	10	"
1831	"	90,259	"	11	4	"

The sum expended for the same purpose in the year ending March 25, 1836, was 69,610l., and assuming the same rate of increase in the population since 1831 as in the ten years preceding that period, the above sum gives an average of about 8s. 1½d. for each inhabitant. These averages are beyond those for the whole of England and Wales.

The sum raised in Dorsetshire for poor-rate, county-rate, and other local purposes, in the year ending the 25th of March, 1833, was 108,193l. 14s., and was levied upon the various descriptions of property as follows:—

	£.	s.
On land	85,591	9
Dwelling-houses	18,561	10
Mills, factories, &c.	1,420	10
Manorial profits, navigation, &c.	2,622	14

The amount expended was:—

	£.	s.
For the relief of the poor	90,488	16
In suits of law, removal of paupers, &c.	2,417	2
For other purposes	14,301	10
	107,207	8

In the returns made up for the subsequent years, the descriptions of property assessed for local purposes are not distinguished. The sums raised in the years 1834, 1835 and 1836 were 103,615l. 11s., 94,915l. 15s., and 82,148l. 12s. respectively, and the expenditure was as follows:—

	1834.	1835.	1836.
For the relief of the poor	£84,243 0	£76,921 3	£68,917 7
In suits of law, removals, &c.	2,624 15	2,068 4	1,793 16
Payment towards the county-rate	11,974 19	9,035 4	6,969 14
For all other purposes		6,330 2	5,556 5
Total money expended	£98,842 14	94,335 13	83,276 7

The saving effected in the sums expended for the relief of the poor in 1836, as compared with the expenditure of 1834, was therefore 16,273l. 12s., or rather more than 19 per cent.; and the saving in the whole sum expended was 15,566l. 7s., or nearly 15¾ per cent.

The county expenditure in 1834, exclusive of the relief for the poor, was 14,733l. 14s. 11d., disbursed as follows:—

	£.	s.	d.
Bridges, buildings, and repairs, &c.	786	7	11
Gaols, houses of correction, &c., and maintaining prisoners, &c.	9,274	19	6¾
Shire halls and courts of justice—building, repairing, &c.	63	15	1
Lunatic asylums	2,251	7	9
Prosecutions	1,696	16	7½
Clerk of the peace	603	1	9

	£.	s.	d.
Conveyance of prisoners before trial .	819	15	5
„ of transports . .	210	16	6
Vagrants—apprehending and conveying	147	10	0
Constables—high and special . .	16	8	10
Coroner	459	16	11
Miscellaneous . . .	860	4	9

The number of persons charged with criminal offences, in the three septennial periods ending with 1820, 1827, and 1834, were 632, 866, and 1150 respectively; making an average of 90 annually in the first period, of 124 in the second period, and of 164 in the third period. The number of persons tried at quarter-sessions, in respect to which any costs were paid out of the county-rates, were 123, 135, and 109 respectively. Of this number, there were—

	1831.	1832.	1833.
Committed for felonies . .	82	83	65
„ misdemeanors	41	52	44

The total number of committals in each of the same years was 123, 135, and 109 respectively: of whom

	1831.	1832.	1833.
The number convicted was .	87	79	79
„ acquitted . . .	17	22	10
Discharged by proclamation .	19	34	20

At the assizes and sessions in 1836 there were 193 persons charged with crimes in this county. Of this number 15 were charged with offences against the person, 10 of which were for common assaults; 13 with offences against property, committed with violence; 158 with offences against property, committed without violence; 1 was committed for arson; 2 for counterfeiting coin and uttering the same; 1 for poaching; 1 for prison-breaking; and 2 for riot. Of the whole number of offenders, 118 were convicted and 75 acquitted, or no bill found against them. Of the number convicted, 5 were sentenced to death, which sentence was commuted to transportation; there were also 14 other persons transported; 1 sentenced to imprisonment for 2 years; 14 for 1 year and above 6 months; and 79 for 6 months and under; 2 were fined, and 3 were discharged on sureties. Of the total number of offenders, 162 were males and 31 were females. Among the whole not one had received superior instruction; 19 could read and write well, 106 could read and write imperfectly; and 63 could neither read nor write; the degree of instruction of the remaining 12 could not be ascertained. The proportion of offenders to the population, in 1836, was 1 in 866.

The number of turnpike trusts in Dorsetshire, as ascertained in 1834, was 17; the number of miles of road under their charge was 359; the annual income arising from the tolls and parish composition was 23,002*l.* 2*s.* 4*d.*, and the annual expenditure, 24,281*l.* 9*s.* 10*d.*

The number of persons qualified to vote for the county members of Dorsetshire was (in 1836) 6320, being 1 in 26 of the whole population, and 1 in 6 of the male population above twenty years of age. The expenses of the last election of county members to parliament were to the inhabitants of the county 233*l.* 13*s.* 11*d.*, and were paid out of the general county-rate.

There are nine savings-banks in this county. The number of depositors and amount of deposits on the 20th of November were:—

	1832.	1833.	1834.	1835.
Number of depositors .	5540	5562	6370	6799
Amount of deposits	£234,344	233,037	259,288	274,792

The various sums placed in the savings-banks in 1834 and 1835 were distributed as under:—

	1834.		1835.	
	Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding £20	2714	£22,468	2907	£23,698
„ 50	2005	60,948	2147	66,226
„ 100	928	64,454	974	66,711
„ 150	385	45,524	417	49,359
„ 200	246	41,902	256	43,657
Above 200	92	23,992	98	25,146
	6370	259,288	6799	274,792

ducation.—The following summary is taken from the lamentary inquiry on education, made in 1835:—

	Schools.	Scholars.	Total.
Infant schools	115		
Number of infants at such schools; ages from 2 to 7 years —			
Males . . .		859	
Females . . .		950	
Sex not specified		392	
			2,201
Daily schools	596		
Number of children at such schools; ages from 4 to 14 years:—			
Males . . .		6,493	
Females . . .		5,566	
Sex not specified		3,898	
			15,957
Schools . .	711		
Total of children under daily instruction			18,158
Sunday schools	316		
Number of children at such schools; ages from 4 to 15 and 16 years·—			
Males . . .		7,577	
Females . . .		8,144	
Sex not specified		4,109	
			19,830

Assuming that the population between 2 and 15 years of age has increased in the same proportion as the whole population since 1821, and that since 1831 the rate of increase has been in the same ratio as in the ten preceding years: there were in 1834 about 50,010 children in Dorsetshire, between the ages of 2 and 15. A very large number of the scholars attend both daily and Sunday-schools, but in what number or in what proportion is uncertain. Thirty-eight Sunday-schools, attended by 1268 children, are returned from places where no other schools exist; but in all other places Sunday-school children have opportunity of resorting to other schools also. Thirty-one schools, containing 1841 scholars, are both daily and Sunday schools, and duplicate entry is known to have been thus far created. We may therefore conclude that not more than two-thirds of the whole population between the ages of 2 and 15 were receiving instruction at the time of the inquiry.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars		Subscrip. and payment from scholars	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	8	36	5	241	101	1,687	6	237
Daily Schools	46	1227	66	3,519	423	8,963	61	2248
Sunday Schools	10	703	296	18,645	2	60	8	422
Total.....	59	1966	367	22,405	526	10,710	75	2907

The schools established by Dissenters, included in the above statement, are:—

	Schools.	Scholars.
Infant schools	3	72
Daily „	9	322
Sunday „	61	4,623

The schools established since 1818 are:—

Infant and other daily schools	373	9,684
Sunday-schools	150	11,810

Twenty-nine boarding-schools are included in the number of daily schools as given above. No school in this county appears to be confined to the children of the Established Church, or of any other religious denomination, such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists, together with schools for children of Roman Catholic parents.

Lending libraries of books are attached to 31 schools in this county.

DORSIBRANCHIA'TA, Cuvier's appellation for the second order of Annelids, which have their organs, and especially their branchiæ, distributed nearly equally along the whole of their body, or at least a part. *Chloeia* (Savigny) and *Cirratulus* (Lamarck), with many other genera, which our limits do not permit us to enumerate, belong to this order. The reader is referred to Lamarck (*Animaux sans Vertèbres*, tome v.); to Savigny (Eg. Annel.); and to Cuvier (*Règne Animal*, tome iii.) as the principal guides on this subject. [ANNELIDA.]

DORSTE'NIA, a genus of plants of the family of the Urticaceæ. The roots of several species of this genus are all confounded under the appellation of Contrayerva root, but as they all possess nearly the same chemical composition and properties, it is of little importance which particular species yields what is used. Indeed, by the time the root reaches Europe, whatever virtues it originally possessed are lost, so that it has scarcely any sensible qualities, and very little effect on the system. It consists of volatile oil, extractive and starch. The first of these gives it some power over the nervous system, should it not have been dissipated by time. Hence it is recommended in the low stages of fever, especially of children; but serpentaria root may at all times be advantageously substituted for it. Contrayerva signifies antidote, and it was at one time supposed to be an antidote to all poisons, whether animal, vegetable, or mineral, except mercury.

DORT or **DORDRECHT**, in antient times called Thuredrecht, a city of South Holland, is situated on an island formed by the Maas, which was separated from the opposite shore in November, 1421, by an irruption of the waters. By this irruption the dikes were broken down, more than 70 villages were destroyed, and an immense number of the inhabitants were drowned. The city is situated twelve miles south-east from Rotterdam, in 51° 49′ N. lat. and 4° 38′ E. long.

Dort is said to have been founded by Merovæus in the fifth century. It is certainly one of the most antient cities in Holland, and was formerly the capital of the province. Its situation is naturally so strong, that although frequently invested it has always made successful resistance to the besiegers. It has a safe and good harbour, and is well situated for trade, having two canals, by means of which goods can be conveyed to warehouses in the heart of the city. The principal trade is that of corn and wood; large rafts of the latter are brought down the Rhine to this place, and there broken up for sale. There are many saw-mills in the town, and ship-building also forms a large branch of its industry. Dort contains about 18,000 inhabitants. Gerard Vossius and the brothers De Witt were natives of the town. The town-hall is a handsome building, and the principal church is 300 feet long and 125 feet wide, with lofty towers and chimes.

DORT, SYNOD OF, an Assembly of Protestant Divines convoked at Dort in the year 1618, by the States General, under the influence of Prince Maurice of Nassau, by which the tenets of the Arminians, in five points, relating to predestination and grace, were condemned by the followers of Calvinism.

At this synod ecclesiastical deputies were present from most of the States of the United Provinces, and from the churches of England, Hesse, Bremen, Switzerland, and the Palatinate. Those from England were Dr. George Carleton, bishop of Landaff; Dr. John Davenant, regius professor of divinity at Cambridge and master of Queen's College; Dr. Samuel Ward, master of Sidney College; and Dr. Joseph Hall, then dean of Worcester but afterwards bishop of Norwich. Dr. Hall's health, after two months, requiring his return, he was replaced by Dr. Thomas Goad. To these was afterwards added Walter Balcanqual, a Scots divine, deputed by King James on behalf of the churches of that nation. The synod was opened on November 13, 1618: it consisted of thirty-eight Dutch and Walloon divines, five professors of universities, and twenty-one lay-elders; the foreign divines amounted to twenty-eight. Those from England had the precedence, after the deputies of the States.

The person by whom the Arminians were headed in defending their cause, was Simon Episcopius, at that time professor of divinity at Leyden, who opened the proceedings, on the part of his sect, with a moderation and eloquence which did him honour. The remonstrants, however, as the Arminians were called, desiring to rest the main defence of their cause, not upon the grounds in reason and scripture on which their opinions were founded, but on their refutation of the opinions of the Calvinists their adversaries, difficulties arose, and their proposal was rejected. They were told that the synod was met to judge, not to confer.

The design of the Arminians, says Mosheim, in the proposal they made, was probably to get the people on their side, by such an unfavourable representation of the Calvinistic system, and of the harsh consequences that seem deducible from it, as might excite a disgust in the minds of those who were present, against its friends and abettors. And it is more than probable that one of the principal reasons that engaged the members of the synod to reject this proposal, was a consideration of the genius and eloquence of Episcopius, and an apprehension of the effects they might produce upon the multitude. When all the methods employed to persuade the Arminians to submit to the manner of proceeding, proposed by the synod, proved ineffectual, they were excluded from that assembly, and returned home complaining bitterly of the rigour and injustice with which they had been treated. Their cause was nevertheless tried in their absence, and, in consequence of a strict examination of their writings, they were pronounced guilty of pestilential errors, and condemned as corruptors of the true religion. This sentence was followed by its natural effects, which were the excommunication of the Arminians, the suppression of their religious assemblies, and the deprivation of their ministers.

Brandt, in the second and third volumes of his 'History of the Reformation in and about the Low Countries,' fol. London, 1720-1722, has given a very minut edetail of the proceedings in the successive sessions of this synod; they were a hundred and eighty in number, and continued till May 29th, 1619. Brandt, however, was an Arminian, and though he is to be relied upon for facts, the reasoning which he occasionally deduces from them requires a comparison with other writers. Maclaine in his 'Notes on Mosheim,' says, the reader will do well to consult the letters of the learned and worthy Mr. John Hales of Eton, who was an impartial spectator of the proceedings of this famous synod, and who relates with candour and simplicity what he saw and heard. All that appeared unfair to the Arminians in the proceedings of this synod, has been collected together in a Dutch book entitled 'Nullitegten, Mishandelingen, ende anbyllike Proceduren des Nationalen Synodi gehonden binnen Dordrecht, &c.'

Of the disputes which had prevailed in Holland for some years, between the Calvinists and Arminians, previous to the convocation of this synod, we have already spoken in the account of Barneveldt the grand pensionary, whose fate was sealed, when it had been sanctioned by the decision of this assembly. (See Brandt, ut supr.; Mosheim's 'Eccl. Hist.' 4to. Lond. 1765, vol. ii. pp. 524, 525; and 'The Articles of the Synod of Dort, and its rejection of errors: transl. from the Latin, with Notes, &c. by Thomas Scott,' 8vo. Lond. 1818.)

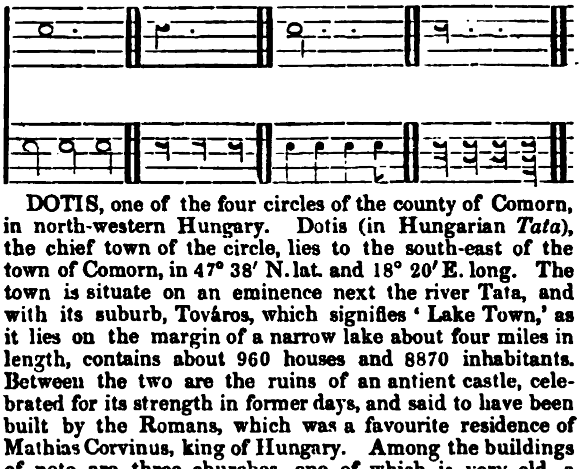
The presentation copy of the 'Acta Synodi Nationalis, autoritate illustr. et præpotentum DD. Ordinum Generalium Fœderati Belgii Provinciarum Dordrechti habitæ anno MDCXVIII et MDCXIX, fol. Lugd. Bat. 1620,' formerly belonging to King James I., splendidly bound in crimson velvet and embroidered with the royal arms, is still preserved in the library of the British Museum. A wood-cut representing the sitting of the synod is prefixed to 'Judicium Synodi Nationalis reformatarum Ecclesiarum Belgicarum habitæ Dordrechti, Anno 1618 et 1619.' 'The Collegiat Suffrage of the Divines of Great Britain concerning the Five Articles controverted in the Low Countries: by them delivered in the Synod, March 6, 1619, being their vote or voice foregoing the joint and publique judgment of the Synod,' was published in English, 4to., Lond. 1629.

An Album containing the signatures of the different members of the synod was delivered to each person at the breaking up of the assembly; one of them was disposed of in London at the auction of Mr. Van Sybstein's MSS. in 1825. The gold medal struck by the States in commemoration of the synod is engraved in the 'Histoire Metallique de la Republique de Hollande, par M. Bizot,' tom. i. p. 139.

In the sixth session, which was held on the 19th November, 1618, the synod of Dort proposed obtaining a translation of the Bible from the original texts into Dutch, which was judged to be a necessary work. In the seventh, and some of the succeeding sessions, the translation was finally agreed to, and rules laid down for the direction of the translators. In the thirteenth session, on the 26th November, the translators were appointed, when the following were chosen by a majority of votes: John Bogerman, the president of the synod; William Baudart and Gerson Bucer, for the Old Testament; Jacobus Roland, Herman Faukelius, and Peter Cornelius, for the New Testament and Apocrypha. The synod then chose sixteen supervisors of the translation; and also resolved, that in case any of the translators should die or be disabled by sickness, the president, with the two assessors, and the scribes of the synod, should be empowered to appoint successors.

After a delay of nearly ten years, the translators of the Old Testament assembled at Leyden, in 1628, and the next year, 1629, the translators of the New Testament; but as Herman Faukelius, pastor of the church of Middleburg, and Peter Cornelius, pastor of the church of Enchusan, had died previous to their meeting together, Anthony Walæus and Festus Hommius were chosen in their stead. When the translation of the Old Testament had advanced as far as the first chapter of Ezekiel, Gerson Bucer died, and was succeeded in his office by Anthony Thysius; Jacobus Roland also died when the translation of the New Testament had advanced to The Acts of the Apostles. The translation of the entire Bible was completed in 1632. The supervisors of the Old Testament met at Leyden, with the translators, in 1633; and those of the New Testament in 1634; and the revision was completed in October, 1635. The printing of the Bible was finished in 1637, when it appeared in folio from the presses of Leyden and the Hague, and in octavo from the press of Amsterdam. This is what is called 'The Dort Bible.' Editions of it were soon rapidly multiplied and extensively circulated. (See Brandt, ut supr. vol. iii. p. 25—28; Leusdeni, *Philologus Hebræo Mixtus*, Diss. x. et xi.; and Townley's *Illustrations of Biblical Literature*, 8vo. Lond. 1821, vol. iii. pp. 400, 401.)

DOT, in music, a point, or speck, placed after a note or rest, in order to make such note or rest half as long again. Thus a semibreve with a dot is equal to three minims: a crotchet rest with a dot is equal to three quaver rests. In modern music a double dot is often used, in which case the second is equal to half of the first. Thus a double dotted minim is equal to three crotchets and a quaver; a double-dotted quaver rest is equal to three semiquaver rests and one demisemiquaver rest. Examples:—



DOTIS, one of the four circles of the county of Comorn, in north-western Hungary. Dotis (in Hungarian *Tata*), the chief town of the circle, lies to the south-east of the town of Comorn, in 47° 38′ N. lat. and 18° 20′ E. long. The town is situate on an eminence next the river Tata, and with its suburb, Tovâros, which signifies 'Lake Town,' as it lies on the margin of a narrow lake about four miles in length, contains about 960 houses and 8870 inhabitants. Between the two are the ruins of an antient castle, celebrated for its strength in former days, and said to have been built by the Romans, which was a favourite residence of Mathias Corvinus, king of Hungary. Among the buildings of note are three churches, one of which is very old, a Capuchin and a Piarist monastery, the latter having a grammar-school, a head-district school, a military hospital, and some warm baths, much in repute. The inhabitants are industrious, have several flour and saw-mills, and manufacture coarse woollen cloths, earthenware and pottery, beer, bed-rugs, &c. In the adjoining village of Bay is a spacious cellar, capable of stowing away 50,000 aulms of wine: among them is a tun which holds 1420 aulms. The Esterházy family have a splendid castle here, with grounds laid out in the English style. At St. Ivány, near Dotis, are quarries of fine marble and freestone. There are vineyards, large sheep-grounds, and extensive forests, in the neighbourhood. Dotis, and much of the surrounding land, are the property of the Esterházy family. There are well attended annual fairs.

DOTTREL. [PLOVERS.]

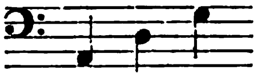
DOUAY, or DOUAI, a town in the department of Nord, on the river Scarpe, near where the canal of the Haute Deule meets it, on the road from Paris by Peronne and Cambray to Lille and Bruges, 121 miles from Paris. It is 108 miles from Paris in a straight line north by east, in 50° 21′ N. lat., and 3° 6′ E. long.

Douay is advantageously situated for commerce. It is surrounded by antient walls, flanked with towers: the walls afford an agreeable promenade. The town is further defended by a fort on the left bank of the Scarpe. The area inclosed by the walls is large, and contains almost as many gardens as dwellings. The streets are well laid out, and the town-hall, the church of St. Pierre (Peter), and the arsenal, one of the most considerable in France, are the principal buildings. The inhabitants, who amounted in 1832 to 18,793, are engaged in manufactures of various kinds, as linens, lace, gauze, cotton goods and yarn, soap, glass, leather, and refined sugar. A considerable trade is carried on in flax, woollen cloth, and cattle. There is every second year an exhibition of the articles of manufacturing industry; and prizes are distributed for the most useful and ingenious inventions or the best finished pieces of workmanship. Medals are likewise annually distributed by the Departmental Society of Agriculture, which has its seat in this town, not at Lille. Douay is the seat of a cour royale, which exercises jurisdiction over the departments of Nord and Pas de Calais. It is also the capital of an arrondissement. There are at Douay an *académie universitaire* or university, a *collège* or high school, a school for the artillery, and a school of drawing and music. The public library consists of 27,000 volumes, and there are a museum of natural history, a botanic garden, and a collection of paintings and antiquities, a foundling hospital, a theatre, two other hospitals (one military), and a military prison.

Douay is a place of great antiquity: it existed in the time of the Romans, and became under the counts of Flanders a place of considerable importance. Phillippe le Bel having a dispute with the count of Flanders, possessed himself of this town A.D. 1297, but it was restored to the counts in A.D. 1368 by Charles V. of France. With the rest of Flanders it passed under the dominions of the kings of Spain; and in A.D. 1552 Philip II. of Spain founded a university here. In 1667 Louis XIV. of France took possession of Douay: it was taken in 1710 by the allies under Marlborough and Eugene, but the French retook it after the English withdrew from the coalition against France. The arrondissement is divided into six cantons, and seventy communes: it had in 1832 a population of 92,750. Much flax is grown, and coal is dug in the neighbourhood of the town.

DOUAY BIBLE. [BIBLE.]

DOUBLE-BASE, the largest musical instrument of the viol kind. [VIOL.] In England, Italy, and France, the double-base has three strings, which are tuned in fourths:



(*An octave lower.*)

In Germany a fourth string is used, tuned a fourth below the deepest of the above.

The double-base, in full orchestral pieces, takes the notes written for the violoncello, when not otherwise directed, and if these are not too rapid, but always gives them an octave lower. It may be considered as the foundation of the band, for a want of firmness in this instrument is more fatal in its consequences than unsteadiness in any other.

In our concerts the Italian name of this instrument, *Contra-basso* (or, more strictly, *Contrab-basso*), is as frequently employed as its English appellation.

DOUBLE STARS. [STARS, DOUBLE.]

DOUBLOON. [MONEY.]

DOUBS, a river in the south-eastern part of France, belonging to the system of the Rhône. It rises in the loftiest ridges of the Jura, at the foot of Mont Rixon, near the village of Mouthe, in the department of Doubs, and flows 75 miles north-east through the lake of St. Point and past the town of Pontarlier to the village of Glovilier, near Porentruy, in Switzerland. Here it makes a sudden bend, and re-entering France, flows 20 miles west-by-south to the town of St. Hypolite, where it receives a small tributary, the Desoubre; below St. Hypolite it makes another bend, and flows north and then north-east 15 miles to the village of Audincourt, where it again turns to the west-by-south and west-south-west, and flows 100 miles, past Clerval, Baume-les-Dames, Besançon, which it nearly encircles [BESANÇON], and Dole, to Verdun-sur-Saône, where it joins the Saône. The whole course of the Doubs is about 2[illegible] miles. The lower part of its course is in the departments of Jura and Saône et Loire.

The source of the Doubs is copious; it is the outlet of a subterranean reservoir formed by the drainage of a considerable surface; but the valley through which it flows in the upper part of its course is narrow, and the stream receives few additions until it reaches Audincourt, just below which it receives the Halle. This part of its course is over limestone; and its waters are partially (in one case, below Pontarlier, almost entirely) absorbed by the cavities which occur in the rock. Near the village of Morteau, a few miles below Pontarlier, there is a fall of 90 ft. The river is used for floating timber and rafts below Audincourt, and occasionally above that place; but the floating is subject to obstruction and danger from the rocks which have rolled down from the mountains into the channel of the river. It was formerly navigable for boats only near the mouth and in some other parts; now, by the formation of the canal from the Rhône to the Rhine, it has been rendered navigable to Clerval. Cuts have been made in some of the parts where the river was very winding, in order to shorten the navigation, which may be estimated at from 75 to 80 miles.

The valley of the Doubs is much wider below Clerval than it is above that place; but it is not very wide in any part; and the affluents of the Doubs are of little importance. The principal are the Laudeux, the Loue, 60 miles long, used for floating timber, the Doraine, and the Guiotte, all which enter the Doubs on the left bank.

DOUBS, a department in France, taking its name from the river Doubs, which has its source and a considerable part of its course within its boundaries. It is on the frontier of France, and is bounded on the south-east side and part of the east side by Switzerland; on the remainder of the east side it is bounded by the department of Haut Rhin; on the north by the department of Haute Saône, and on the west by the department of Jura. This department is irregularly shaped: its greatest length is, from north-east near Montbéliard to south-west near the source of the Doubs, 76 miles: its greatest breadth, at right angles to the length, is from near Marnay on the Oignon to Jougne, on the road from Pontarlier to Lausanne, 48 miles: the area is 2111 square miles, being below the average of the French departments, and about equal to the joint areas of the English counties of Wilts and Berks. The population, in 1832, was 265,535, not much more than two-thirds of the average population of the French departments, and rather less than that of the English county of Sussex; the relative population was 126 to a square mile; the average relative population of France being about 160 to a square mile, and that of England 260. The population is very unequally distributed: in the plains it is far above the average of France, but very thin indeed in the mountainous parts. The department is comprehended between 46° 33′ and 47° 33′ N. lat., and between 5° 42′ and 7° 8′ E. long. Besançon, the capital, is 205 miles in a straight line south-east of Paris; or 237 miles by the road through Provins, Troyes, Châtillon-sur-Seine, Dijon, and Dôle.

The south-eastern part of the department is traversed by the ridges of the Jura, which have a general direction north-east and south-west: the summits of Laumont, Chaumont, Mont Dor, and Rissons, are the principal: the last-mentioned is about 2170 feet high, and the highest point in the department. On these summits no vegetation appears; they are composed of bare rocks, covered with snow nearly two-thirds of the year. The slopes of these mountains are rocky, with patches of moss, and straggling thorns and hazels. On the south side the slopes afford good pasturage, and pleasant valleys sheltered by pine forests: in some of the valleys barley and oats are raised, but the temperature is too cold for wheat or rye. The few inhabitants of these highlands preserve the hospitality and simplicity of manners which mark the people of a mountain tract. Between the higher country and the valley of the Doubs is a district of inferior elevation, marked by a milder air and a more productive soil than belong to the district just noticed. Wheat, though in small quantity, is produced; and on some of the more favourable slopes the vine is cultivated; in the woods the oak and the beech replace the pine. Many tracts in this and the more elevated region are marshy, and from them flow the principal streams that water the department. The plain or valley of the Doubs occupies the rest of the department; it is fertile and populous.

The rivers are the Doubs, and its tributaries; and the Oignon, a tributary of the Saône, which, rising in the Vosges, flows south-west into the Sâone; it touches the boundary of this department below Villersexel (Haute Saône), and separates it through a considerable part of its course from the department of Haute Sâone. The tributaries of the Doubs which are within this department are, the Drujon, which falls into it below Pontarlier, the Desoubre, the Halle, the Laudeux, and the Loue. The Vaux, the Braine, and the Loison are feeders of the Loüe; and the Creuse and the Cusancin are feeders of the Laudeux. There are several lakes, but none of any size except the lake of St. Point, formed by the river Doubs, which is about five miles long and one or two broad.

The canal which unites the navigation of the Rhône with that of the Rhine traverses this department throughout, and consists partly of an artificial channel, partly of that of the river Doubs. The department is ill provided with roads; a road from Paris by Dijon, Besançon, and Pontarlier to Lausanne passes through it: another road from Bâle and Belfort to Dôle and Beaune passes along the valley of the Doubs through Baume les Dames and Besançon: a road from Besançon runs through Quingey to Poligny, in the department of Jura; and another from Pontarlier to Salins and Dôle, both in the department of Jura: another road runs from Besançon to Vesoul, in the department of Haute Saône; and another from Bâle to Clerval, where it falls in with the road from Bâle and Belfort to Besançon. The others are all bye roads.

The mineral treasures of the department are considerable. There were formerly silver mines in Mont Dor, but they are no longer wrought: oxide of iron is procured in abundance; freestone is quarried; and marl, sand proper for making glass, ochre, and a species of inflammable schistus are dug. Peat for fuel is procured in many places. The temperature is variable, and colder than the latitude would give reason to expect: the rains are frequent and heavy, but the climate is not by any means unhealthy. The soil is in different parts composed of sand, clay, or marl, or a combination of these substances. Wheat, rye, mixed corn, maize, hemp, potatoes, pulse, wine, and fruit are produced in the plain; barley, oats, a little flax, and timber in the higher grounds. The agricultural produce, except in barley, and perhaps oats and potatoes, is very far below the average of France. Oats and potatoes form a considerable part of the food of the poorer classes: the Spanish oat is that chiefly cultivated. Agriculture is in a backward state. The quantity of horses and oxen in proportion to the population is very considerable: cattle constitute the wealth of the mountaineer. The artificial grasses are cultivated; trefoil is found to be better suited to the climate than either lucerne or sain-foin. There are extensive common lands, on which cattle are fed. The number of sheep in the department is comparatively very small.

The department is divided into four arrondissemens or sub-prefectures: Montbéliard in the north-east and east, population 55,642; Pontarlier in the south, population 48,977; Besançon in the west, population 96,032; and Baume les Dames, centre and north, population 64,884. These four arrondissemens are subdivided into 27 cantons and 646 communes. The capital, Besançon, on the Doubs, has a population of 24,042 for the town, or 29,167 for the whole commune, and Baume les Dames, also on the Doubs, a population of 2209 for the town, or 2467 for the whole commune. [BAUME; BESANÇON.] Of the other towns we subjoin some account.

Montbéliard is on the little river Halle, just before its junction with the Doubs. It was formerly the capital of a small principality; it is now a thriving and industrious town, the capital of an arrondissement. It is pleasantly situated in the valley which separates the ridges of the Jura from those of the Vosges, and is surrounded by vineyards. It is well built, and adorned by several fountains. An antient castle, once the residence of the princes of Montbéliard, and in which the archives of their principality are still preserved, commands the town: it now serves as a prison and a barrack for the gendarmerie. The market-house (*bâtiment des halles*) and the church of St. Nicholas, which has a roof 85 feet long by 53 broad without pillars to sustain it, are the buildings most worthy of notice. The inhabitants amounted, in 1832, to 4671 for the town, or 4767 for the whole commune: they manufacture watch movements, watchmakers' files, cotton yarn, hosiery, woollen cloths, kerseymeres, and leather: they carry on a considerable trade with Switzerland. The arrondissement of Montbéliard is distinguished by the prevalence of manufactures similar to those carried on in the town itself, with the addition of saw manufactories, glass-houses, paper-mills, and oil-mills. The number of tan-yards is great in every part of the department, but especially in this arrondissement.

Pontarlier is on the Doubs, in the upper part of its course, 36 miles south-south-east of Besançon, by the road through Ornans. It is near a natural pass from France into Switzerland, known to the antients, and defended by a fort (the Fort of Joux) on the pyramidal summit of Mont Joux. This fort of Joux was the place of the confinement and death of Toussaint L'Ouverture, the Haytian chief. Pontarlier has been supposed by D'Anville to be the Ariolica of the Itinerary of Antoninus, the Abiolica of the Theodosian Table; but the soundness of his opinion has been disputed: the most antient records give it the names of Pontalia, Pons Ælii, Pons Arleti, and Pons Ariæ. Until the fourteenth century, there were two adjacent towns, Pontarlier and Morieux, but they now form only one. It has been repeatedly destroyed by fire, the last time in 1754. It is well built, and is surrounded by an antient wall, but not fortified. There are a library, a high school, a custom-house, and a fine range of barracks for cavalry. The population has, from the increase of trade, doubled in the last forty years: the inhabitants, in 1832, amounted to 4248 for the town, or 4707 for the whole commune: they manufacture steel, bar iron, iron and steel goods of various kinds (among them are cannon, nails, steel wire, and watch and clock movements), porcelain, and calicoes: there is a copper foundery, at which are made church bells and cylinders for printing calicoes: there are also tan-yards and paper-mills. A great quantity of extract of wormwood is made here every year. Among the natives of Pontarlier was General d'Arçon, the contriver of the floating batteries at the siege of Gibraltar, in 1782. [ARÇON.] The neighbourhood of Pontarlier produces excellent cheese.

Ornans is seventeen miles from Besançon, in the arrondissement of Besançon, on the road to Pontarlier. It is walled: near the walls are the remains of an antient castle: there are a fine hospital and a public library. The inhabitants in 1832 amounted to 2858 for the town, or 2982 for the whole commune: they manufacture a considerable quantity of leather, some paper, cheese, and extract of wormwood. Immediately round the town cherries are cultivated in great quantity; and an excellent kirschwasser is prepared from them. The neighbourhood of Ornans abounds with natural curiosities; as the grottos of Baumarchais, Bonnevaux, Mouthier, and Châteauvieux, the cascades of Mouthier, and the well of Breme, which, when the rivers overflow their banks, is filled with a muddy water that rises in it, flows over the top, and inundates the valley in which the well is situated: on these occasions it throws up a number of fishes.

Beside the foregoing, there are in the arrondissement of Montbéliard the towns of Blamont, near the Doubs, and St. Hypolite, or Hippolyte, on that river. Blamont is a fortified town, but is very small. The inhabitants manufactured, at the commencement of the present century, fire-[illegible], [illegible], iron wire, and paper: we have no later account. At St. Hypolite hard-wares are made and cheese. There are many iron factories in the neighbourhood. The town is in a valley, immediately surrounded with vine-covered hills, backed by mountains covered with wood. Near St Hypolite is a curious cavern, between eighty and ninety feet high, which penetrates horizontally the perpendicular face of a rock: the name of the cavern, 'Le Château de la Roche,' is derived from an antient castle at the entrance, which was ruined in the religious wars of the sixteenth century; the ruins still remain. Audincourt, a village on the Doubs, has a population of 1000: the inhabitants manufacture iron goods and cotton yarn. Mandeure, another village in the arrondissement, is on the site of a Roman town, Epamanduorum. There are the remains of an amphitheatre, and medals and other antiquities have been dug up. At the village of Herimoncourt are manufactured wooden screws, and clock and watch movements: wooden screws are made at Dampierre.

In the arrondissement of Baume les Dames are the towns of Clerval on the Doubs, Rougemont, and Passavant. The [illegible] of Rougemont are engaged in the manufacture [illegible]: at Clerval, the Doubs, by the junction of the [illegible] Canal, becomes navigable. In the arrondissement of Besançon are the towns of Quingey and Vil-[illegible] [illegible]gey is a town of less than 1000 inhabitants, who are engaged in the manufacture of iron goods. There is an antient castle, once the residence of the counts of Bourgogne; and near the town is a cavern, adorned with a variety of congelations. Near Boussière, which is not far from Quingey, is a remarkable cavern, consisting of a suite of apartments, extending above half a mile in length.

In the arrondissement of Pontarlier are the towns of Rochejean and Morteau on the Doubs, La Rivière on the Drujon, and Jougne on the border of Switzerland. At Rochejean are smelting houses for pig iron and cast iron, tan yards, and a saw yard; and at La Rivière are a saw yard and a linseed-oil mill. At the village of Levier, and in the neighbourhood, a good deal of cheese is made: near the village is a pit, the depth of which is unknown: it appears to consist of a succession of caverns on different levels: it is used as a receptacle for the carcases of animals and other refuse. Two dogs which had by accident fallen into one of the caverns lived for a long time on the bodies thus disposed of, and brought forth young before they were discovered and rescued. The village of Mont Benoit (Benedict), on the Doubs, has a handsome Gothic church, formerly the conventual church of a considerable abbey which existed here. The neighbouring village of Remonot has for its church a remarkable cave.

The department of Doubs sends four members to the Chamber of Deputies; it forms, with the department of Haute Saône, the diocese of the archbishop of Besançon. It is in the jurisdiction of the Cour Royale, or Supreme Court of Besançon, and in the sixth military division, of which the head-quarters are at Besançon. Education is more general in this department than in almost any other in France: there is one boy at school for every eleven persons.

The inhabitants of the mountains are tall, robust, and healthy; sober, economical, gentle, willing to oblige, hospitable, and true to their word, but untaught and credulous; those of the plain are neither so robust, nor temperate, nor obliging. This department is part of the former county of Bourgogne, or Franche Comté. (*Dictionnaire Universel de la France;* Malte Brun; Dupin, *Forces Productives de la France; Dictionnaire Géographique Universel.)*

DOUCHE. [BATHING.]

DOUCKER. [DIVERS.]

DOUGLAS FAMILY. This family derives its name from certain lands on the Douglas or Black water, in the shire of Lanark, which were granted out about the middle of the twelfth century by Arnold, Abbot of Kelso, to one Theobald, a Fleming, whose son was thence called William de Douglas.

William married a sister of Friskin de Kerdal, in the province of Moray, and had several children, all of whom, except the eldest, settled in the north. Brice, the second son, became bishop of Moray; Alexander, the third, became sheriff of Elgin; and their sister, Margaret, married Hervey de Keith, great mareschal of the kingdom.

Archenbald, the eldest son, married one of the daughters and co-heiresses of Sir John de Crawford, of Crawford, and had two sons, William and Andrew, each of whom had two sons likewise. William's eldest son married a sister of Lord Abernethy, but dying without issue, was succeeded by his brother, some time governor of the castle of Berwick. Andrew's eldest son married the only daughter of Alexander, lord high steward of Scotland, and had two sons, the eldest of whom was Sir James Douglas of Loudon, so called to distinguish him from his cousin, 'the good Sir James,' one of the chief associates of Bruce in achieving the independence of his country. He was made a knight banneret under the royal standard at Bannockburn, where he commanded the centre division of the Scottish van. He died in a contest with the Saracens when, in fulfilment of the trust committed to him, he was on his way to deposit the heart of Bruce in the Holy Land.

William de Douglas, some time governor of Edinburgh Castle, was a natural son of Sir James of Loudon, whose eldest lawful son, also William de Douglas, had the earldom of Athol conferred upon him on the death of John Campbell without issue; but he soon afterwards resigned the title, and gave a charter of the earldom to Robert, lord high steward of Scotland. This William de Douglas was lord of Liddisdale, and though himself 'the flower of chivalry,' as he was called, is to be particularly distinguished from Sir William Douglas, the knight of Liddisdale, natural son of the good Sir James. The knight of Liddisdale being mented the eulogy which Fordun gives him, of being 'England's scourge and Scotland's bulwark;' but the praise of patriotism, and even of humanity itself, he outlived; for being hurt at Ramsay of Dalwolsey's appointment to the sheriffship of Roxburgh, he waited his opportunity, and came upon the brave and virtuous Ramsay with an armed band, wounded him, and dragged him away to Hermitage castle. There Douglas immured his unoffending victim, faint with thirst, and with his rankling wounds, till, after a period of seventeen days' suffering, death at length terminated his existence. The government of the country was in such a state at the time, that the king not only could not avenge the outrage, but was obliged to pardon the relentless murderer, and moreover to put him into the vacant sheriffship. He at last died by the hand of an assassin of the house of Douglas.

The good Sir James had another natural son, whom we shall mention presently, but having no lawful issue, he was succeeded by his brothers, Hugh and Archibald, the latter of whom married the daughter of John Cumyn, of Badenoch, by Marjory, sister of John Baliol, king of Scotland, and had two sons, the younger of whom, William, inherited the family estates, and became earl of Douglas, in which character we find him lord justiciar of Lothian the year in which King Robert II. ascended the throne. He was thrice married. He married first a daughter of the twelfth earl of Mar, and in her right was styled earl of Douglas and Mar. His son James, second earl of Douglas and Mar, married Margaret, eldest daughter of King Robert II., but leaving no surviving male issue, the earldom of Mar devolved on his sister, and the earldom of Douglas on Archibald Douglas, the natural son of the good Sir James above alluded to, by special settlement. This Archibald, third earl of Douglas, styled from his great prowess 'Archibald the Grim,' had himself a natural son, who married a daughter of King Robert II.

William, the first earl of Douglas, had no children by his second marriage. By his third marriage, which was with the Lady Margaret, sister and heir of the third earl of Angus, he had a son, George, who obtained, on his mother's resignation, a grant of the earldom of Angus. He also got a grant of the sheriffship of Roxburgh, and is found in that office anno 1398. The previous year he married Mary, second daughter of King Robert III.

Sir John Douglas, who gallantly defended the castle of Lochleven against the English in the minority of David II., was a younger brother of William, lord of Liddisdale, above mentioned. He had several children, three of whom only however we shall here notice, James, Henry, and John. The last of these married Mariota, daughter of Reginald de Cheyne, co-justiciar of Scotland beyond the Grampians, with John de Vaux. Sir Henry married a niece of King Robert II., and by her had a son, who married a granddaughter of the same king. Sir James, the eldest, succeeded his uncle, the lord of Liddisdale, in the lordship of Dalkeith and his other extensive possessions. He was twice married, his second wife being a sister of King Robert II. His eldest son, by his first marriage, married a daughter of King Robert III., and had a grandson, who married Johanna, daughter of King James I., and relict of James, third earl of Angus, and was on the 14th March, 1457-8, created earl of Morton.

We have thus three earls of the House of Douglas: the earl of Douglas, the earl of Angus, and the earl of Morton.

Archibald IV., earl of Douglas, eldest son of Archibald the Grim, married the eldest daughter of king Robert III., and by her had a son of the same name, who in the lifetime of his father was styled earl of Wigton. On the death of King James I. he was chosen one of the council of regency, and the next year made lieutenant-general of the realm. His two sons, particularly William, the young earl of Douglas, despising the authority of an infant prince, and encouraged by the divisions which arose among the nobility, erected a sort of independent power within the kingdom, and forbidding the vassals of the house to acknowledge any other authority, created knights, appointed a privy council, and assumed all the exteriors of royalty. They were both at length however beheaded, and the earldom of Douglas passed to a grand-uncle whose eldest son married his cousin, the fair maid of Galloway, and restored the house to its former splendour. He became lieutenant-general of the kingdom, and no less formidable to the crown than the last in his family who held that high office. But this power proved his ruin, and dying without issue, he was succeeded by his brother, in whom this great branch of the house of Douglas was cut down and overthrown for treason.

Archibald V., earl of Angus, great-grandson of William, first earl of Douglas, through George, who obtained the earldom of Angus on his mother's resignation as above mentioned, was some time warden of the East Marches, and on the death of Argyle was made lord high chancellor of the kingdom, and so continued till 1498, when he resigned. He was commonly called 'the Great Earl of Angus;' and, according to the historian of his house, was 'a man every way accomplished both for mind and body.' Gawin, bishop of Dunkeld, the translator of Virgil, was his third son by his first marriage, which was with a daughter of the lord high chamberlain of Scotland. The bishop's two elder brothers, George, master of Angus, and Sir William Douglas of Glenbervie, fell on the fatal field of Flodden; and their father, the old earl, who had in vain dissuaded the king from the ruinous enterprize, bending under the calamity, retired into Galloway, and soon after died. Sir Archibald Douglas of Kilspindie, the earl's son by a second marriage, was made lord treasurer of Scotland towards the end of the year 1526, by king James V., who used to style him his 'Grey Steil;' and the next year we find Archibald VI., earl of Angus, eldest son of the deceased George, master of Angus, lord high chancellor of the kingdom. This Archibald, the sixth earl of Angus, married Margaret of England, queen dowager of James IV., and had by her a daughter, who became the mother of Henry, lord Darnley, husband of Mary queen of Scots, and father of James I. of England. His brother, Sir George, was forfeited on his fall, and spent the remainder of James's reign in exile in England; and their sister Jean was burnt as a witch on the castle hill of Edinburgh. The son of Sir George succeeded his uncle as seventh earl of Angus; and on the death of his son, the eighth earl, commonly called 'the Good Earl of Angus,' without male issue, Sir William Douglas of Glenbervie, great-grandson of Archibald the great earl, succeeded to the earldom, and had soon afterwards a charter from king James V., confirming all the antient privileges of the Douglas, namely, to have the first vote in council, to be the king's lieutenant, to lead the van of the army in the day of battle, and to carry the crown at coronations.

The seventh earl of Angus had a younger brother, who became fourth earl of Morton, and was the famous Regent Morton. He was condemned to death for the murder of Darnley, and was executed by the *maiden*, an instrument which he himself introduced into Scotland.

Sir William Douglas of Glenbervie above mentioned conveyed the lands of Glenbervie to a younger son. His eldest son became tenth earl of Angus; and the son of the latter was in 1633 created marquis of Douglas, the same year in which another branch of the Douglas family was advanced to be earl of Queensberry. Archibald, eldest son of the first marquis of Douglas, officiated as lord high chamberlain at the coronation of king Charles II., and was thereupon created earl of Ormond. His younger brother William had been some years before created earl of Selkirk; but marrying afterwards Anne, duchess of Hamilton, he was on her grace's petition created duke of Hamilton for life, and a new patent of the earldom of Selkirk issued in favour of his younger sons, two of whom were themselves also elevated to the peerage. The third marquis of Douglas was advanced to be duke of Douglas; but on his death the dukedom became extinct, and the marquisate devolved on the seventh duke of Hamilton. His grace was one of the party to the great 'Douglas cause,' the subject of which was the Douglas estates; but these were ultimately awarded to his opponent, who becoming entitled to the estates, assumed the name and arms of Douglas, and in 1790 was raised to the peerage as baron Douglas of Douglas castle, in the shire of Lanark.

The year following, George, 16th earl of Morton, was enrolled among the peers of Great Britain as baron Douglas of Lochleven. The third earl of Queensberry had previously been raised to a marquisate and dukedom; and the fourth duke of Queensberry, who was also third earl of March, made a peer of England by the title of baron Douglas of Amesbury; but on the death of his grace in 1810, the English barony, conferred upon himself, and the earldom of March, conferred upon his grandfather, expired; while the dukedom devolved on the duke of Buccleuch, and the original peerage descended to the present marquis of Queensberry.

DOUGLAS, GAWIN, was born in the year 1474 or 1475, and was the third son of Archibald, sixth earl of Angus, surnamed Bell the-Cat. (Scott's *Marmion*, canto vi., st. xi.) Being intended for the church, he received the best education which Scotland and France could give. He obtained successively the provostship of the collegiate church of St. Giles's, Edinburgh, and the rectorship of Heriot church. He was then made abbot of Aberbrothick, and lastly, bishop of Dunkeld, but his elevation to the archbishoprick of St. Andrews was prevented by the pope. In 1513 some political intrigues compelled him to retire to England, where he was favourably received by Henry VIII. He died of the plague in 1521 or 1522, at the Savoy, where he had resided during the whole of his stay.

In his early years he translated Ovid's 'Art of Love,' and composed two allegorical poems, 'King Hart' and 'the Palace of Honour:' but he is best and most deservedly known by his translation of Virgil's 'Æneid,' which, with the thirteenth book by Mapheus Vegius, was produced in 1513. To each book is prefixed an original prologue, some of which give lively and simple descriptions of scenery, written in a manner which proves their author to have been possessed of considerable poetical power.

At the end of the work (p. 380, ed. of 1553), he informs us that 'compilet was this work Virgilean' 'in eighteen moneths space,' for two months whereof he 'wrote never one word.' He is also solicitous that his readers should

> ——— 'read leal, and take good tent in time
> They neither maul nor mismetre his rhyme;'

which reminds us of Chaucer's address to his book—

> 'So pray I God that none miswrité thee,
> Nor thee mismetre for default of tongue.'

Those who take the trouble to examine Douglas for themselves, will find his language not near so different from our own as might be imagined from a cursory glance at the pages. The chief difference consists in the spelling and the accent, which we may suppose to have borne, as in Chaucer, a considerable resemblance to the present pronunciation of French; at least without some such supposition it will be found impossible to scan either. (Warton's *Hist. Engl. Poetry* (who gives copious extracts), and *Biog. Brit.*, art. 'Douglas.')

DOUGLAS. [Man, Isle of.]

DOUR. [Hainault.]

DOURA, or DURRA. [Sorghum vulgare.]

DOURO in Portuguese, Duero in Spanish, one of the principal rivers of the Peninsula, rises in the Sierra de Urbion, in the north part of the province of Soria in Old Castile. It first flows southwards, passing by the town of Soria, then turns to the west, through the provinces of Burgos, Valladolid, and Zamora, and receives numerous affluents both from the north and the south, the principal of which are, 1. the Pisuerga, which rises in the Asturian mountains, and after receiving the Alanzon from Burgos and the Carrion from Palencia, passes by Valladolid, and enters the Douro above Tordesillas; 2. the Seguillo, also from the north, passes by Medina del Rio Seco, and joins the Douro above Zamora; 3. the Esla, a large stream, comes from the mountains of Leon, and enters the Douro below Zamora. After receiving the Esla, the Douro reaches the frontiers of Portugal, where it turns to the south, and for about fifty miles marks the boundary between the province of Salamanca in Spain, and that of Tras os Montes in Portugal. In this part of its course it receives first the Tormes, a considerable stream, from the south-east, which rises in the Sierra de Gredos, and passes by Salamanca, and then the Agueda, from Ciudad Rodrigo. The Douro then turns again to the west, and crosses the north part of Portugal, marking the limits between the provinces of Tras os Montes and Entre Douro e Minho on its north bank, and the province of Beira on its south bank. The principal affluents of the Douro in Portugal are the Coa from the south, and the Sabor and Tamega from the north. The Douro passes by the towns of Lamego and Oporto, and [illegible] the latter city, of which it forms [illegible] the Douro with its windings [illegible], through some of the finest and most fertile [illegible] of Spain and Portugal.

DOUW, GERARD, was born at Leyden in 1613. He was put by his father, a glazier, to study drawing under Bartholomew Dolendo, an engraver, with whom he remained eighteen months. He afterwards received the instructions of Peter Kouwhoorn, a painter on glass, and learned his art so well that he proved of great advantage to his father. The latter, however, alarmed at the danger he incurred by mounting to his work at church windows, made him study painting instead, and the illustrious Rembrandt was chosen for the lad's master. From that great painter Gerard learned the mastery of colour and chiaroscuro: but he differed entirely from his teacher in his manner of painting. Instead of growing bolder and rougher in his handling as he grew older, he became more and more delicate in his finish, elaborating everything which he touched with the most exquisite delicacy and minuteness, in so much that the threads of brocades, and of fine carpets are expressed even in his smallest paintings. Nothing escaped his eye nor his pencil. And yet with all his elaboration of detail his pictures are powerful in effect, and harmonious and brilliant in colour. He was accustomed to prepare his own tools, that he might have them of the requisite fineness.

Gerard Douw has been charged with excessive slowness in finishing; and some anecdotes are told in proof of it. Sandrart says, that he once visited Gerard's study in company with Bamboccio, and on their both expressing their admiration of a certain miniature broom-handle in one of his pictures, he said, that he should spend three more days upon it, before he left it. It is said that his sitters were so wearied by his dilatoriness, and disgusted by the transcripts of their jaded faces, which he faithfully put upon the canvass, that others were deterred from sitting, and he was obliged to abandon portrait-painting. But Karel de Moor, who had been a pupil of his, averred that he was not so slow as had been asserted; and the number of his pictures tends to corroborate his statement. Douw got excellent prices for his paintings; generally from 600 to 1000 florins and Sandrart informs us that Spiering, a gentleman of the Hague, paid him an annual salary of 1000 florins, for the mere right of refusal of all the pictures he painted, at the highest price he could obtain. Gerard Douw died in 16[illegible]. The most famous among his pupils was Mieris. His pictures are in all great collections. (Argenville; Sandrart.)

DOVE. [Columbidæ.]

DOVEDALE. [Derbyshire.]

DOVER, one of the Cinque Ports, a borough and market-town, having separate jurisdiction, in the eastern division of the county of Kent, 16 miles south-east by south from Canterbury and 72 east-south-east from London. Dover is situated on the coast, at the opening of a deep valley formed by a depression in the chalk hills, which here present a transverse section to the sea. This depression runs into the interior for several miles, and forms the basin of a small stream.

Dover was called by the Saxons Dwyr, from dufyrrha (a steep place), or from dwr (water), thre being a small stream in the valley at the extremity of which Dover stands. By the Romans it was called Dubris, whence Dover.

From its proximity to the continent, Dover has for many years been the usual port of embarkation for passengers going both from and to England. [Calais.] In the reign of Henry VIII. the emperor Charles V. landed here, and Henry on that occasion contributed a large sum for the erection of a pier, which was subsequently completed in the reign of Elizabeth. The castle, which is on the northern side of the town, is supposed to have been originally constructed by the Romans. The southern heights of Dover were originally strongly fortified during the late war, and extend in a semicircle as far as the famous Shakspeare's Cliff, so called from the celebrated scene in 'King Lear.'

The boundaries of the present borough, in addition to the old borough, include a part of the parish of Buckland, and comprise a population of 15,298 persons; 1651 were registered after the passing of the Reform Act. The borough sends two members to parliament. It appears from the Municipal Corporation Report to be doubtful whether there are any charters. A court of record is held three times a week. The general sessions are held three times a year before the recorder and other justices. There was a hundred court, but it has fallen into disuse. The town consists principally of one street about a mile long, running in the direction of the valley. A theatre and assembly-room were erected in 1790. The town is now considered a fashionable watering-place, and possesses every convenience for sea-bathing. Many handsome houses have recently been built for the accommodation of visitors in the season. The harbour is not very good, but it can accommodate ships of 500 tons, and is principally used for sailing and steam packets to France. It has now for some years (1837) been undergoing repairs and improvements, but it does not seem probable that it can ever be made a good port. Some corn is ground in the neighbourhood, and exported to London; and there are some paper-mills near the town. The market-days are Wednesday and Saturday. An annual fair is held on the 23rd of November.

There are two churches, St. James's and St. Mary's; the former worth 145*l*., the latter 287*l*. per annum; as well as a new church, and places of worship for Baptists, Society of Friends, Independents, Wesleyan Methodists, Unitarians, and Roman Catholics. A charity-school for boys and girls was founded in 1789; it has received various donations, and in 1820 a new building, capable of containing 200 boys and 200 girls, was erected. The hospital of St. Mary, afterwards called the Maison-Dieu, was founded in the 13th Henry III. by Hubert de Burgh, earl of Kent and chief justice of England. [Cinque Ports.]

DOVETAIL, a term in joinery. A dovetail is the end of a piece of wood fashioned into the fan-like form of a dove's tail, and let into a corresponding hollow of another piece of wood. Dovetails are either exposed or concealed; 'concealed dovetailing is of two kinds, lapped and mitred.' (Nicholson's *Dict.*)

DOVRAFIELD. [Norway.]

DOWER (Law) is that part of the husband's lands, tenements, or hereditaments which come to the wife upon his death, not by force of any contract expressed or implied between the parties, but by operation of law, to be completed by an actual assignment of particular portions of the property.

Prior to the reign of Charles II., five, and until the passing of the act 3 & 4 Wm. IV., c. 105, four kinds of dower were known to the English law.

1. Dower at the common law.
2. Dower by custom.
3. Dower ad ostium ecclesiæ.
4. Dower ex assensu patris.
5. Dower de la plus beale.

This last was merely a consequence of tenure by knight's service, and was abolished by stat. 12 Charles II. c. 24; and the 3rd and 4th having long become obsolete, were finally abolished by the above-mentioned statute of Wm. IV.

By the old law, dower attached upon the lands of which the husband was seised at any time during the marriage, and which a child of the husband and wife might by possibility inherit; and they remained liable to dower in the hands of a purchaser, though various ingenious modes of conveyance were contrived, which in some cases prevented the attaching of dower: but this liability was productive of great inconvenience, and frequently of injustice. The law too was inconsistent, for the wife was not dowable out of her husband's equitable estates, although the husband had his courtesy in those to which the wife was equitably entitled. [Courtesy.] To remedy these inconveniences the statute above mentioned was passed, and its objects may be stated to be, 1, to make equitable estates in possession liable to dower; 2, to take away the right to dower out of lands disposed of by the husband absolutely in his life or by will; 3, to enable the husband, by a simple declaration in a deed or will to bar the right to dower.

'The law of dower,' say the Real Property Commissioners, in their Second Report, upon which this statute was founded, 'though well adapted to the state of freehold property which existed at the time when it was established, and during a long time afterwards, had, in consequence of the frequent alienation of property which takes place in modern times, become exceedingly inconvenient.' In short, dower was considered and treated as an incumbrance, and was never, except in cases of inadvertency, suffered to arise. The increase of personal property, and the almost universal custom of securing a provision by settlement, afforded more effectual and convenient means of providing for the wife. Dower at the common law is the only species of dower which affects lands in England generally; dower by custom is only of local application, as dower by the custom of gavelkind and Borough English; and freebench applies exclusively to copyhold lands. The former is treated of in Robinson's 'History of Gavelkind,' the latter in Watkins on 'Copyholds.'

In order to describe dower at the common law clearly, it will be advisable to follow the distribution of the subject made by Blackstone.

1. Who may be endowed.
2. Of what a wife may be endowed.
3. How she shall be endowed.
4. How dower may be barred or prevented.

1. *Who may be endowed.*—Every woman who has attained the age of nine years is entitled to dower by common law, except aliens, and Jewesses, so long as they continue in their religion. And from the disability arising from alienage, a queen, and also an alien licensed by the king, are exempt.

2. *Of what she may be endowed.*—She is now by law entitled to be endowed, that is, to have an estate for life in the third part of the lands and tenements of which the husband was solely seised either in deed or in law, or in which he had a right of entry, at any time during the coverture, of a legal or equitable estate of inheritance in possession, to which the issue of the husband and wife (if any) might by possibility inherit.

3. *How she shall be endowed.*—By Magna Charta it is provided, that the widow shall not pay a fine to the lord for her dower, and that she shall remain in the chief house of her husband for forty days after his death, during which time her dower shall be assigned. The particular lands and hereditaments to be held in dower must be assigned by the heir of the husband, or his guardian, by metes and bounds if divisible, otherwise specially, as of the third presentation to a benefice, &c. If the heir or his guardian do not assign, or assign unfairly, the widow has her remedy at law, and the sheriff is appointed to assign her dower; or by bill in equity, which is now the usual remedy.

4. *How dower may be barred or prevented.*—A woman is barred of her dower by the attainder of her husband for treason, by her own attainder for treason, or felony, by divorce *à vinculo matrimonii*, by elopement from her husband and living with her adulterer, by detaining the title-deeds from the heir at law, until she restores them, by alienation of the lands assigned her for a greater estate than she has in them; and she might also be barred of her dower by levying a fine, or suffering a recovery during her marriage, while those assurances existed. But the most usual means of barring dower are by jointures, made under the provisions of the 27 Hen. VIII., c. 10; and by the act of the husband. Before the stat. 3 & 4 Wm. IV., c. 105, a fine or recovery by the husband and wife was the only mode by which a right to dower which had *already attached* could be barred, though, by means of a simple form of conveyance, a husband might prevent the right to dower from arising at all upon lands purchased by him. By the above-mentioned statute, it is provided that no woman shall be entitled to dower out of any lands absolutely disposed of by her husband either in his life or by will, and that his debts and engagements shall be valid and effectual as against the right of the widow to dower. And further, that any declaration by the husband, either by deed or will, that the dower of his wife shall be subjected to any restrictions, or that she shall not have any dower, shall be effectual. It is also provided that a simple devise of real estate to the wife by the husband shall, unless a contrary intention be expressed, operate in bar of her dower. This statute however affects only marriages contracted, and only deeds, &c., subsequent to 1st January, 1834.

Most of these alterations, as indeed may be said of many others which have recently been made in the English real property law, have for some years been established in the United States of America. An account of the various enactments and provisions in force in the different states respecting dower may be found in 4 Kent's *Commentaries*, p. 34-72. (Bl. *Com.*; Park *on Dower*.)

DOWLETABAD, a strongly fortified town in the province of Aurungabad, seven miles north-west from the city of Aurungabad, in 19° 57′ N. lat., and 75° 25′ E. long. The fort consists of an enormous insulated mass of granite, standing a mile and a half from any hill, and rising to the height of 500 feet. The rock is surrounded by a deep ditch, across which there is but one passage, which will allow no more than two persons to go abreast. The passage into the fort is cut out of the solid rock, and can be entered by only one person at a time in a stooping posture. From this entrance the passage, still cut through the rock and very narrow, winds upwards. In the course of this passage are several doors by which it is obstructed, and the place is altogether so strong, that a very small number of persons within the fort might bid defiance to a numerous army. On the other hand, the fort might be invested by a very inconsiderable force, so as effectually to prevent any supplies being received by the garrison, who, owing to the intricacy of the outlet, could never make an effective sally. The lower part of the rock, to the height of 180 feet from the ditch, is nearly perpendicular, and it would be wholly impracticable to ascend it. The rock is well provided with tanks of water.

Since the seat of government has been transferred to Aurungabad the town of Dowletabad has greatly decayed; only a small portion of it is now inhabited. This place is said to have been the residence of a very powerful rajah in the thirteenth century, when the Mohammedans under Allah ud Deen carried their arms into this part of the Deccan. In 1306 the fort and surrounding country were brought under the dominion of the emperor of Delhi. About the close of the sixteenth century they were taken by Ahmed Nizam Shah of Ahmednuggur, and in 1634, during the reign of Shah Jehan, again came into the possession of the Moguls. Dowletabad has since followed the fate of that part of the Deccan, having been conquered by Nizam ul Mulk, with whose successors, the Nizams of Hyderabad, it has since remained.

DOWN, the fine hair of plants, is a cellular expansion of the cuticle, consisting of attenuated thin semitransparent hairs, either simple or jointed end to end, or even branched, as in the Mullein. When attached to seeds, it enables them to be buoyed up in the air and transported from place to place. When covering the external surface of a plant, it undoubtedly acts as a protection against extremes of temperature, and probably as a means of absorbing moisture from the air.

DOWN, a maritime county of the province of Ulster in Ireland; bounded on the north by an angle of Loch Neagh, the county of Antrim, and the bay of Belfast; on the east and south by the Irish channel; and on the west by the counties of Louth and Armagh, from which it is partly separated by the bay of Carlingford and the river of Newry. The greatest length from Cranfield point on the south-west to Orlock point on the north-east is 51 English miles; greatest breadth from Moyallan on the west to the coast near Ballywalter on the east, 38 miles. The coast line (including Lough Strangford) from Belfast to Newry, exclusive of small irregularities, is about 125 English miles. The area, according to the Ordnance Survey of Ireland, consists of—

	Acres.	Roods.	Poles.
Land	608,415	2	15
Water	3,502	1	14
Total	611,917	3	29

Statute measure, or 956 square statute miles nearly.

Down forms the south-eastern extremity of Ulster. The surface of nearly all the county is undulating; but the only uncultivated district is that occupied by the Mourne mountains and the detached group of Slieve Croob. The mountainous district of Mourne is bounded on the east by the bay of Dundrum and on the west by the bay of Carlingford, and covers an area of nearly 90 square miles. Beginning from the west, the principal elevations are Cleomack, 1257 feet; Tievedockaragh, 1557 feet; Eagle Mountain, 2084 feet, having on the north Rocky Mountain, 1328 feet, and on the south Finlieve, 1888 feet; Slieve Muck North, 2198 feet, from the north-western declivity of which the river Bann takes its rise at an altitude of 1467 feet; Slieve Muck South, 1931 feet; Slieve Bingian, 2449 feet; and north of these Chimney Rock Mountains, 2152 feet; Slieve Bearnagh, 2394 feet; Slieve Corragh, 2512 feet; and Slieve Donard, 2796 feet, the highest ground in the county, which overhangs the sea above Newcastle, a small town situated on the western shore of Dundrum bay. This mountain group contains much fine scenery. Its north-eastern declivities are clothed for several miles with the plantations of Tullymore Park, the splendid residence of the Earl of Roden; its western flanks overhang the beautiful vicinities of Warren's Point and Rosstrevor, and on the narrow strip between its southern declivities and the sea is situated the fine demesne of Mourne Park the residence of the Earl of Kilmorey. The Slieve Croob range covers an area of about ten square miles to the north east of the Mourne Group. Slieve Croob, the highest elevation of the range, has an altitude of feet; on its north-eastern declivity the river Lagan rises elevation of about 1250 feet above the level of the sea.

The remainder of the county, about 850 square miles, is productive, being either under cultivation or serving the purposes of turbary. The numerous hills which diversify the surface are seldom too high for arable cultivation; and the irregularity of the surface facilitates drainage, and likewise affords a shelter, which, from the scarcity of timber in some parts of the county, is of material advantage. A low chain of cultivated eminences, well timbered, and on the northern and western side covered with the demesnes and improvements of a resident gentry, commences east of Dromore, and extends under various names along the valley of the Lagan and the eastern shore of Belfast Loch, as far as Bangor. The only detached eminence of any consequence is the hill of Scrabo at the head of Loch Strangford, 534 feet. This range separates the basin of the Lagan from that of Loch Strangford.

The eastern shore of Belfast Loch has no anchorage for vessels above the third class. There is a small quay for fishing and pleasure-boats at Cultra, a mile below the bathing village of Holywood, where regattas are held. Out of Belfast Loch the first harbour on the coast of Ards is at Bangor, where a pier was built by parliamentary grant in 1757, forming a small harbour in the south-east part of the bay of about 300 ft. square. Fifteen sail of carrying vessels belong to this place, which are chiefly engaged in the export of corn and cattle to the coast of Scotland. Colonel Ward, the proprietor, is engaged in the construction of a pier, which, when completed, will afford fifteen feet at low water within the harbour. The coast here consists of low slate rocks; and there is a difficulty in getting stones of a sufficient size, which has hitherto retarded the completion of this desirable work. East of Bangor is the little harbour of Groomsport or Gregory's Port, where Duke Schomberg landed in 1690. Here is a small quay and about 100 houses, chiefly occupied by fishermen. South-east of Groomsport is Donaghadee, the only place of security for a large vessel from Belfast Loch south to the harbour of Strangford. [DONAGHADEE.] Off Donaghadee lie three islands, called the Copelands, from a family of that name which formerly held the opposite coast. On one of these, called the Cross or Lighthouse Island, there is a lighthouse, which marks the entrance to Belfast Loch from the south. This building, which was erected about 1715, is a square tower, 70 ft. high to the lantern: the walls 7 ft. thick. The mode of lighting practised in 1744, when Harris wrote his 'History of Down,' was by a fire of coals kindled on a grate, which was fixed on an iron spindle rising from the masonry. On a windy night this grate used to consume a ton and a half of coal. This island contains 40 acres; the other two, 295 and 31 acres respectively. The sound between Big Island, which lies nearest the land, and the shore of Down, is about a mile and a quarter in breadth. It has from 7 to 8 fathoms of water; but the side next the mainland is foul; and a rock, half a mile from the shore, called the *Deputy*, which has but 10 ft. of water at low ebb, renders the navigation difficult in hazy weather.

From Donaghadee south the coast is low, rocky, and dangerous. The rock of Sculmartin, covered at half-tide, and the North and South Rocks, the former never covered, the latter at every half tide, lie farthest off shore, and are most in the way of vessels coming up channel. The lighthouse of Kilwarlin was erected on the South Rock in 1[illegible], and has since proved highly serviceable to all traders in the channel. At Ballywalter, Ballyhalbert, Cloghy, and Newcastle, in Quintin Bay, all situated on the eastern shore of Ards, are fishing stations. The first is very capable of improvement as a harbour, and there is a small quay for the supply of the Kilwarlin Lighthouse at the latter; but no shelter in any of them for vessels of more than 30 tons.

South from Newcastle is Tara Bay, much frequented by fishing-vessels, and capable of great improvement. The estimated expense of a breakwater pier, which would convert it into an excellent tide harbour, is 3806*l*. The peninsula of Ards runs out at Ballyquintin to a low rocky point south of Tara Bay. A rock, called the Bar Pladdy, having 11 ft. of water at spring ebbs, lies immediately off Quintin Point, and the entrance to Strangford Loch is erroneously laid down in Mackenzie's Map as lying through the narrow intermediate channel called Nelson's Gut. Several shipwrecks have occurred in consequence. The true entrance to Strangford Loch lies west of the Bar Pladdy, between it and Killard Point, on the opposite side. The entrance is a narrow channel of about 5 miles in length by an average breadth of less than a mile. Within, the loch of Strangford expands into a very extensive sheet of water, extending northwards to Newtownards, and nearly insulating the district between it and the sea. The tide of so large a sheet of water making its way to and from the sea, causes a great current in the narrow connecting strait at every ebb and flow, and renders the navigation at such times very difficult. Across this strait is a ferry, which gives name to the town of Portaferry at the eastern or Ards side of the entrance. The town of Strangford, which lies opposite, is supposed to derive its name from the strength of the tide race between. The true channel, at the narrowest part of the strait, is little more than a quarter of a mile across, being contracted by rocks, one of which, called the Ranting Wheel, causes a whirlpool dangerous to small craft. There is another but less dangerous eddy of the same kind at the opposite side. Within the entrance there are several good anchorages, and landing-quays at Strangford, Portaferry, Killileagh, the quay of Downpatrick, and Kirkcubbin. Killileagh quay was built by parliamentary grant in 1765, and cost 1200*l.*, but is now much gone to decay. Strangford Loch contains a great number of islands, many of which are pasturable, and great numbers of rabbits are bred in them. From Killard Point the coast bears south-west, and is rocky and foul as far as Ardglass, where there is a pretty good harbour, safe for small vessels, by which it is much frequented, but exposed to a heavy ground swell in south-easterly gales. A pier was built here about 1819 at the joint expense of the old fishery board and the proprietor, Mr. Ogilvie. There is a small lighthouse at the extremity of this pier. Ardglass is a principal place of resort for the fishing fleets which frequent the channel. Immediately west of Ardglass lies the harbour of Killough, between Ringford Point on the east and St. John's Point on the west. A natural breakwater, easily improvable, extends between these points, and gives a pretty secure anchorage for large vessels within. There is an inner harbour for small craft, dry at ebb, with a quay, built about the beginning of the last century.

West of St. John's Point opens the great bay of Dundrum, which extends from this point on the east to the coast of Mourne on the west, a distance of about four leagues by a league in depth, running north by west. This bay is exposed, shallow, and full of quicksands, and so situated that, till the erection of the present pier, which forms a small asylum harbour at Newcastle, a well-frequented bathing-place on the south-western side of the bay, vessels embayed here with an east or south-east wind inevitably went on shore. From an inspection of the books of the resident revenue officer stationed at Newcastle, it has been ascertained that from 1783 to 1835, 58 vessels, valued at 209,050*l.*, have been wrecked in Dundrum Bay. The pier of Newcastle was erected at the joint expense of the old fishery board and the proprietor, Earl Annesley: the cost was 3,600*l.* It is highly serviceable as a station for the fishing-boats of the coast, and has been the means of saving four vessels within the last three years.

From Newcastle south to Cranfield Point the coast of Mourne possesses only three small boat harbours, the principal of which is at Derryogua, where there is a fishing station. On this part of the coast, near Kilkeel, is a lighthouse, 120 feet high. Between Cranfield Point on the east, and the extremity of the barony of Dundalk, in the county of Louth, on the west, is the entrance to the extensive harbour of Carlingford. This loch is about eight miles long by a mile and a half broad, and has steep mountains to the east and west along each side. From Narrow Water, where it contracts to the width of a river, the tide flows up to Newry, whence there is a canal communication with the Upper Bann river, which flows into Loch Neagh. There are numerous rocks and shoals at the entrance, where a new lighthouse is about being erected, and a bar all across, on which there are but eight feet of water at ebb tides. The middle part of the loch is deep, but exposed to heavy squalls from the mountains. The best anchorages are off Carlingford, on the south side, and opposite Warren's Point, and Rosstrevor, in the county of Down. There are two great beds of oysters in this loch, one off Rosstrevor Quay, two and a half miles long by half a mile broad; the other off Killowen Point, one mile long by half a mile broad. The marquis of Anglesey is the proprietor. The fishery is open to all persons paying 5*s.* yearly. About 1000*l.* worth of oysters are taken annually: they sell in Warren's Point at 7*s.* to 15*s.* per thousand, and are celebrated throughout Ireland for their excellent flavour. It has been proposed to carry the Newry canal, which terminates at Fathom, at the head of the bay, forward to the deep water off Warren's Point, where it is intended that it should terminate with a ship lock and floating basin. Warren's Point has a good quay, from which steamers sail regularly for Liverpool: most of the exports of Newry are shipped here from the small craft that bring them down the canal. The scenery on both sides of Carlingford Loch is of striking beauty.

With the exception of the Upper Bann, all the rivers of Down discharge their water into the Irish channel. The navigable river Lagan, which, throughout near half of its course, has a direction nearly parallel to the Bann, turns eastward at Magheralin, four miles north-east of which it becomes the county boundary, and passing by Lisburn, falls into the bay of Belfast, after a course of about thirty miles. The Ballynahinch or Annacloy river brings down the waters of several small lakes south-east of Hillsborough, and widens into the Quoile river, which is navigable for vessels of 200 tons a mile below Downpatrick, where it forms an extensive arm of Strangford Loch. The Quoile is covered with numerous islands, and its windings present much beautiful scenery. The Newry river rises near Rathfriland, and flowing westward by the northern declivities of the Mourne range, turns south a little above Newry, and after a short course falls into the head of Carlingford Loch. Numerous streams descend from the district of Mourne immediately to the sea, and there is no part of the county deficient in a good supply of running water.

The Lagan navigation, connecting Loch Neagh with Belfast Loch, gives a line of water communication to the entire northern boundary of the county; and the Newry Canal, connecting the navigable river Bann with the bay of Carlingford, affords a like facility to the western district, so that, with the exception of about ten miles between the Bann and the termination of the Lagan navigation, the entire county boundary is formed either by the coast line or by lines of water carriage. The Lagan navigation was commenced in 1755, and cost upwards of 100,000*l.*, but owing to mismanagement and the difficulties of keeping a rapid river navigation in repair, it has not proved a profitable speculation. The summit level, towards Loch Neagh, is 112 feet above the level of the sea.

The Newry Canal admits vessels of 50 tons through the heart of Ulster. It was commenced in 1730, by commissioners appointed under an Act of the Irish Parliament, passed in the 3rd of George II., and was wholly constructed by government. The original object was chiefly to afford a water carriage for the coals of Tyrone district to Dublin. The canal lies partly in the county of Down and partly in Armagh; it extends, from its junction with the Bann river near Guilford, to Fathom, on the bay of Carlingford, about 14 Irish or 17¾ English miles, having its summit level 77 feet above the sea. The average breadth of the canal at top is 40 feet: the locks are 15 in number, and 22 feet in the clear. The canal was opened in 1741, but being among the first works of the kind attempted in Ireland it required numerous repairs, and has not yet made any considerable return for the original outlay. From the year 1802 to the year 1817, the total amount of toll received was 27,838*l.* 13*s.* 6½*d.*, and the total expenditure was 70,495*l.* 18*s.* 8¼*d.*; and for the succeeding ten years the gross receipts were 25,461*l.* 19*s.* 6*d.*, and the gross expenditure 16,897*l.* 14*s.* 7½*d.* This navigation was vested in the directors-general of Ireland navigation down to 1827. It is now under the control of the Board of Works.

Down is well supplied with roads. The great northern road from Belfast to Dublin passes through the county from north to south, by Hillsborough, Dromore, Banbridge, Loughbrickland, and Newry: this is the only turnpike road in Down. The other chief lines are from Belfast to Donaghadee by Newtownards; from Belfast to Downpatrick by Ballynahinch; and from Downpatrick to Newry by Castlewellan and Rathfriland. The roads in general are hilly, but well constructed, and kept in excellent repair by the grand jury. The Ulster Railroad, from Belfast to Armagh, will pass through parts of the parishes of Moira and Shankill in this county. The entire length, when completed, will be 36 miles and 291 yards. A railroad has been projected from Belfast to Holywood, a bathing-place much resorted to by the citizens of Belfast in summer

The vicinity of the sea prevents the continuance of frosts on the east and south; and the insulated position of the mountainous tract confines the heavier mists and rains to that part of the county where their effects are least felt. The general inequality of the ground carries off surface waters and prevents damps, so that the climate, although somewhat cold, is considered very wholesome. The prevailing winds in spring are from the east: westerly winds, although more frequent than from any other point, have not so great a prevalence as in the neighbouring counties. Larch timber thrives on very exposed situations on the Mourne mountains.

The chief geological features are strongly marked. The Mourne and Slieve Croob groups consist of granite. The boundary of this primitive district begins from the east at Dundrum, whence passing northward to Slieve Croob, it runs nearly due west, including the lordship of Newry, and passes into the adjoining counties of Armagh and Louth. This mass of granite reappears in Cavan, and probably is the same which rises on the opposite side of the island in the mountains of Sligo. Northward and eastward of the granite district the whole of the remainder of the county is occupied by an extension of the transition series which forms the southern basin of Loch Neagh. Clay slate in greater or less degrees of induration is the prevalent rock. Towards the sea on the north-east and east slate quarries are common. On the Antrim boundary near Moira an extension of the tertiary limestone formation which occurs throughout the basaltic district occupies a small portion of this county, and affords a most valuable supply of lime manure to the north-western baronies. Limestone boulders are found along the eastern shore of the Bay of Belfast; and at Carthespil, near Comber, on the western side of Strangford loch, there is a quarry of reddish granular limestone. Great quantities of marl are raised in the neighbourhood of Downpatrick. The junction of the greywacke and granite may be observed along the eastern branch of the river Lagan, where it rises on Slieve Croob.

Copper ore has been found in the mountains about five miles north-east of Rosstrevor; also near Portaferry, and at Clonligg, between Newtownards and Bangor. At the latter place is a lead-mine which has been worked with moderate success at various times. Lead ore occurs on the estate of Ballyleady, in the same neighbourhood, and on that of Bryansford, near Newcastle; also at Killough, and near Portaferry. A lead-mine has likewise been worked in the Blundel estate, half a mile from Dundrum. Indications of coal have been observed in the north-east of the county, and ochreous earths have been found in various places; but hitherto without leading to any practical result.

Chalybeate spas occur at Newry, Dromore, Magheralin, near Donaghadee and Rathfriland, and at various places in the barony of Ards. A chalybeate strongly impregnated with sulphur and nitre rises about two miles north-west of Ballynahinch, on the declivity of Slieve Croob mountain, which has been found very efficacious in scorbutic cases: the village of Ballynahinch has become a rather fashionable resort during the summer months in consequence.

The prevalent soil in the low district is a stony loam formed by the decomposition of the schistose rock. Clayey soils are confined to the north-east of the county and the barony of Ards, and are of a strong and productive quality, but they are wet and require a large quantity of manure. The richest soil in the county is in the district of Lecale, and a small tract of loam incumbent on limestone gravel in the neighbourhood of Moira and Magheralin: the timber here is of larger growth than elsewhere in Down. Alluvial tracts are frequent, and yield luxuriant crops of grass without manure. The bogs in general are not larger than is advantageous for purposes of turbary. Moory land is confined to the mountain district: the soil is here light and gravelly; but with proper cultivation, as in the vicinity of Newry and of Castlewellan, can be made to yield good crops of oats and barley. Considerable quantities of wheat are raised throughout the county, but chiefly along both shores of Strangford Loch; oats and barley are the chief produce of the south and centre of the county. Numerous resident nobility and gentry set an example of the best modes of cultivation; and several farming societies encourage competition among the landowners by annual ploughing matches and cattle-shows. The contrast between the slovenly farming of Meath and the workmanlike manner in which the land is fenced and laid down in this county strikes an observer travelling from Dublin to Belfast very forcibly. The system of green crops and stall feeding is now being pursued by most of the gentlemen-farmers; but has not yet become general among the ordinary landowners. Fences on the Antrim boundary and along the line of the Dublin road are of quickthorn; clay banks and dry stone walls are most common in the other parts of the county.

Large quantities of sea-weed are used as manure along the north-east and eastern coast. The distance of limestone quarries renders lime manure very expensive throughout the central baronies; but in the south and south-east there is an abundant supply of marl in the barony of Lecale. This valuable substance is found in morasses and alluvial tracts at the bottoms of hills, and consists entirely of marine exuviæ: the bed of marl is sometimes five feet in thickness. It was first brought into use in 1707, before which time the neighbouring country was only moderately fertile in oats and barley: but with a judicious use of this manure it now yields excellent crops of wheat. The immediate advance on the value of land which followed its introduction was four-fold, and a corn trade was opened from Strangford in consequence. The eagerness, however, with which this manure was applied led to the bad consequences which always attend strong manuring and over cropping; and it is said that so late as 1804 some of these lands had not yet recovered. The annual agricultural produce of Down has been valued at 1,396,000*l.*; the rental of proprietors at 172,329*l.* per annum, and the rent to occupiers of land, 22*s.* per acre.

The following table exhibits the quantities of wheat, &c., sold at the principal grain markets of Down in the years 1834-5. The market of Newry is supplied from Armagh and other counties, as well as from Down; and large quantities of the produce of Down are disposed of at Belfast.

	Wheat. tons.	Oats. tons.	Barley. tons.	Rye. tons.	Bere. tons.	Whether grain market increasing or decreasing.
Downpatrick	3,200	380	2,400	200	450	Increasing
Portaferry .	1,600	214	1,600	...	...	ditto
Strangford .	570	195	800	...	...	Decreasing
Ardglass . .	400	390	400	...	...	ditto
Killough . .	1,600	200	1,000	...	...	Increasing
Ballynahinch	3	1,700	7	4	...	Decreasing
Killileagh .	1,900	200	140	...	...	Increasing
Banbridge . .	1,330	...	...	...	...	ditto
Moira . . .	214	90	...	...	...	Decreasing
Dromore . .	...	...	...	...	...	No return [illegible]
Newtownards .	1,000	700	800	...	...	Increasing.
Newry . . .	7,710	23,850	3,610	...	...	ditto

Down is not a grazing county, nor are there any sheep farms; but great numbers of pigs are reared for the provision markets of Newry and Belfast. The general condition of the people is much superior to that of the peasantry of the southern counties. Wages of labourers are 10*d.* per day in winter, and 1*s.* during the rest of the year: the average number of days' work obtained in agriculture each year is 160. The resident nobility and gentry are more numerous in proportion to the extent of the county than in any other part of Ulster. Among the principal may be mentioned the marquisses of Downshire and Donegal, and during a part of each year the marquis of Londonderry and Lord Clanwilliam, the earl of Roden, Earl Annesley, Lord Dufferin and Claneboy, Lord Bangor, Sir Robert Bateson, Mr. Ker, Colonel Forde, Mr. Sharman Crawford, &c., with incomes varying from 8000*l.* to 60,000*l.* per annum. The yeomanry of the county are an intelligent class. Blue cloth is the usual dress of the better class of the peasantry, and the loose frieze coat so common in Louth and the borders of Armagh is rarely seen here. The provisions of the lighting and paving act have been put in force in Newry and Downpatrick, and Banbridge, and are about being extended to Dromore.

Down contains seven baronies, and part of the lordship of Newry; the remainder of this division lying in Armagh. The baronies are—Ards, on the east and north-east, between Loch Strangford and the sea, containing part of the town of Newtownards, total population (in 1831) 4442; and the towns of Portaferry, population 2203; Bangor, population 2741; Donaghadee, population 2986; Ballywalter, population 664; and Kirkcubbin, population 537; Castlereagh on the north-east and north, between Loch Strangford and the county of Antrim, containing the towns of Ballymacarratt (the eastern suburb of Belfast), population 516[illegible].

Comber, population 1377; Holywood, population 1288; and Saintfield, population 1042. Dufferin, on the western shore of Loch Strangford, contains the town of Killileagh, population 1187. Iveagh, Lower, on the north and north-west towards Antrim and Loch Neagh, containing the town of Hillsborough, population 1453; Dromore, population 1942; and Moira, population 787. Iveagh, Upper, on the west and midland, containing the towns of Banbridge, population 2469; Rathfriland, population 2001; Loughbrickland, population 676; Warrenspoint, population 1856; Rosstrevor, population 996; and Castlewellan, population 792. Kinelearty, midland, between Upper Iveagh and Dufferin, containing the town of Ballynahinch, population 976. Lecale, on the south-east, between Strangford Loch and Dundrum bay, containing the borough of Downpatrick, population 4784; and the towns of Ardglass, population 1162; Killough, population 1169; and Strangford, population 584. Mourne, lying between Dundrum bay and Carlingford Loch, containing the town of Kilkeel, population 1039; and part of the lordship of Newry, containing part of the borough of Newry, the total population of which is 13,065.

Down returns four members to the imperial parliament, viz. two for the county, one for the borough of Newry, and one for the borough of Downpatrick. Besides these boroughs, Newtownards, Bangor, Killileagh, and Hillsborough returned members to the Irish parliament, and are still corporate towns. The lordship of Newry, the greater part of which lies within this county, is subject to a peculiar ecclesiastical jurisdiction exercised by the family of Needham as representatives of Sir Nicholas Bagnall, to whom, after the dissolution of religious houses in Ireland, the abbey of Newry with all its immunities and privileges was granted in fee by Edward VI. The manor of Mourne formed a portion of the original grant, and passed by marriage to the family of Paget, who claim the same ecclesiastical immunities for it in the diocese of Down as the Needham family for their portion in the diocese of Dromore, but hitherto without success. The authority of the representatives of the late Lord Kilmorey in his lordship of Newry extends to the presentation to livings, the granting of marriage licences, probates, &c., in their ecclesiastical capacity, and to the holding of courts baron and leet, and discharging all recognizances to the Crown forfeited within that jurisdiction, in their civil capacity.

The linen manufacture is the staple trade of Down, and gives employment to a greater number of operatives, in proportion to the population, than in any other part of Ireland. In 1831 the number of linen weavers was 6711; that of weavers of damask, 6; the number of wheelwrights (makers of wheels for spinning linen yarn by hand) was 142; and of those employed in making other machinery for the manufacture of linens, millwrights, reed-makers, shuttle-makers, &c., 2267; together with 24 engaged in making machinery for drapers, and 49 for damasks; all exclusive of female hand-spinners throughout the county; so that the entire number to whom the trade gives occupation may be safely stated at 16,000. The linen manufacture has been long carried on in Ireland, but its first great impulse was in consequence of the settlement of French refugees on the revocation of the edict of Nantes, who, by introducing the improved machinery of the continent, and setting an example of more business-like habits, raised the manufacture to a high degree of perfection and importance. To M. Crommelin, who settled at Lisburn in the reign of William III., Down owes the introduction of the improved manufacture on an extensive scale: before his time no web finer than of the quality called 'a fourteen hundred' had been made in Ireland. This enterprising individual imported a thousand looms from Holland, and gave the manufacture such importance as secured it the attention and patronage of government. In the 4th of Queen Anne the export duty on Irish linens was taken off, and from that time the trade has continued to flourish.

The importation of flax-seed employs a considerable capital in Belfast and Newry. It is generally thought necessary to renew the seed from year to year; but a few farmers have lately saved their own seed, and the practice has so far proved successful. The dressing of the grown crop gives employment to numerous scutchers and hecklers throughout the county; but the introduction of linen spinning machinery has materially lessened the demand for hand labour in converting the dressed flax into thread. Manufacturers, however, prefer hand-spun thread for the weft, and the demand is still sufficient to give occupation to numerous females, who, except at the times of harvest, haymaking, and raising the potato crop, can make from 3d. to 4d. per day, besides attending to their ordinary rural pursuits. Weaving is mostly carried on in the houses of small farmers, and there are few weavers who do not give part of their time to agriculture; hence they are generally a healthy and long-lived class of men. Hand-spinning and weaving are not confined to any particular district. When the webs are ready for the bleacher, they are carried to market. The following table, drawn up in 1802, exhibits the quality of cloth manufactured in the district surrounding each town. It is difficult to ascertain the quantity made in the county at large, as the markets of Lurgan, Lisburn, and Belfast, are in a great measure supplied from the northern parts of Down, and it not unfrequently happens that what is sold in one market is resold in another.

Linen Markets in Down.	Quality of Linen sold in each.
Newry	from 8 to 12 hundreds;
" a few	up to 16 ditto.
Rathfriland	from 8 to 14 ditto.
Kilkeel	" 8 to 10 ditto.
Downpatrick	" 6 to 10 ditto.
Castlewellan	" 3 to 9 ditto.
Ballynahinch	" 6 to 14 ditto.
Banbridge	" 9 to 15 ditto.
Dromore	" 10 to 20 ditto.
Hillsborough	" 6 to 20 ditto.
Portaferry and Kirkcubbin	" 10 to 14 ditto.*

The next process, and that which employs nearly an equal number of hands, is the bleaching and preparing for market the green web as purchased from the weaver. The chief manufacturing district of this county, as of Ireland at large, is along the valley of the Upper Bann. The waters of this river are peculiarly efficacious in bleaching; and its rapid descent affords numerous sites for the machinery employed. From Tanderagee in Armagh, to five miles above Banbridge in Down, the banks of this river present an almost continuous succession of bleaching greens. On that part of the river which flows through Down there are eighteen of these establishments, each covering a large tract of ground, and giving employment to a numerous rural population. Besides these establishments, there are upon the Bann several extensive flour mills, a vitriol manufactory, and two factories for spinning linen thread by machinery. The waste of these bleach greens is found highly valuable as a manure. The neighbourhood of Gilford and Moyallan, about half way between Banbridge and Tanderagee, is celebrated for its rural beauty. Orchards are attached to all the better class of cottages, and the vicinity of so many bleach greens gives the effect of a continuous tract of rich park scenery on each bank of the river. The proprietors of the majority of these establishments are Dissenters and members of the Society of Friends, and the population generally is Protestant.

The cotton and muslin manufacture in 1831 gave occupation to 3278 individuals: of these 307 were muslin weavers, and 13 were weavers of corduroy. The principal market for muslin fabrics is Belfast. This trade is not on the increase. The leather manufacture is carried on pretty briskly in Newry and in various parts of the county. The number of operatives employed in both in 1831 was 69. There is an extensive iron foundry near Ballymacarratt, which supplies much of the machinery used in the factories of Belfast. Here also are salt and vitriol works, with a manufacture of coarse glass. The manufacture of kelp is carried on to some extent on the shores of Loch Strangford.

The exports and imports of Down are made almost entirely through the ports of Belfast and Newry. The net receipts of customs' duty at Newry in 1836 was 43,867*l.* About 80,000 firkins of butter are exported yearly from Down, and this as well as all other exports is increasing.

The fishery on the coast from Bangor to Carlingford bay is pursued with a good deal of industry, but hitherto without sufficient capital or skill. The herring fishery commences in July, and is pursued throughout the autumn and beginning of winter. The principal fishing ground lies off Lecale, at a distance of a quarter of a mile to two leagues from shore, in three to seventeen fathom water, and extends with little interruption from Newcastle on the south to the entrance to Strangford Loch upon the north. The fish taken are herrings, mackarel, haddock, cod, ling, glassan, bream, pollock, gurnet, plaice, bait, and turbot. Besides this there are several other fishing grounds off the coasts of Mourne and Ards.

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* The linens being one yard wide, are distinguished by the number of threads contained in that breadth; thus an eight hundred web is one whose warp contains that number of threads of yarn.

The following table exhibits the number of boats and men employed in the fishery in 1835 at each of the coast-guard stations as below:—

STATION.	Decked Vessels.			Half-decked Vessels.			Open sail boats.		Row-bts.		No. of Fishermen.
	No.	Tonnage	Men	No.	Tonnage	Men	No.	Men	No.	Men	
Cranfield	..	..	..	..	28	..	..	..	85	452	452
Leestone	..	..	..	..	..	..	..	..	21	126	126
Annalong	5	126	30	3	..	18	..	..	36	216	264
Newcastle	..	..	..	..	..	..	..	..	27	135	135
St. John's Point Killough	1	22	7	2	22	14	..	..	37	196	217
Ardglass	2	45	16	10	126	62	..	..	12	60	138
Gun's Island	..	..	..	6	55	30	2	8	6	26	64
Strangford	..	..	..	16	158	80	10	40	18	72	192
Cloghy	2	35	No return	16	174	No return	1	No return	32	No return	175
Ballyhalbert	1	25	6	18	180	108	..	..	24	120	234
Millisle	..	..	..	..	..	..	..	..	27	135	135
Donaghadee	..	..	..	3	30	15	..	..	29	87	102
Groomsport	..	..	..	9	99	36	8	40	..	..	76
Bangor	2	35	8	..	..	..	..	..	..	..	8
Holywood	..	..	..	..	..	..	2	4	4	10	14
	13	288	67	83	872	363	23	92	358	1608	2365

Upwards of 300 boats frequent Ardglass harbour during the fishing season. Of those about one-third are from England, one-third from the Isle of Man, and one-third from Arklow, Skerries, and other places on the Irish coast. This concourse of fishermen causes a considerable trade in Ardglass. Three additional butchers have booths here for the sale of meat during the season. The English and Man boats are larger and better found than the Irish. Their tackle and gear also are of a superior description; and although so many inhabitants of the coast appear by the above table to be engaged in the pursuit, it is a remarkable fact that neither at Newry, Downpatrick, nor Belfast, is there a sufficient supply of fish, and that the salt herrings consumed throughout the county are invariably of Scotch curing. There is ample occupation for five times the number of men at present engaged in the fishing off this coast.

The county assizes are held twice a year at Downpatrick. Quarter sessions are held by the assistant barrister twice a year at Downpatrick, Newry, Dromore, and Newtownards. The constabulary force stationed in Down in the year 1835 consisted of 5 chief constables, 30 constables, 114 sub-constables, and 6 horses; and the expense of their support was 6,884*l.* 6*s.*, of which 3,297*l.* 10*s.* 8*d.* was chargeable against the county.

Before and for some time after the coming of the English, Down was known as Ulladh or Ulidia, the original of the name of Ulster. The antient inhabitants are supposed to have been the Voluntii of Ptolemy. The north-eastern portion of Down was at an early period occupied by the Picts, of whom there was a considerable colony so late as the 6th and 7th centuries, extending from Strangford Loch to the Lower Bann in Antrim. Whether these Picts, who are called *Cruithne* by the annalists, were of a nation essentially different from the bulk of the Celtic inhabitants of Ireland is still under discussion: the region occupied by them abounds with stone-circles, cromlechs, and subterranean galleries, which usually mark the presence of this peculiar people. The territory occupied by them was called Dalaradia, and extended from the Ravil river in Antrim over the southern part of that county and the north and north-east of Down.

Date.	How ascertained.	Houses.	Families.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort	36,636	..	..	..	..	..	..	201,500
1813	Under Act of 1212	53,310	..	..	..	..	..	..	287,290
1821	Under Act 55 Geo. III. c. 120	59,747	63,631	..	..	..	156,599	168,811	325,410
1831	Under Act 1 Wm. IV. c. 19	62,629	66,233	34,447	17,979	13,807	169,416	182,596	352,012

The presence of St. Patrick in this county in the sixth century is attested by authentic records, and can be traced with topographical exactness at the present day. Downpatrick, Saul, Dromore, Moville, and Bangor, are the chief ecclesiastical foundations of Patrick and his immediate successors. Of these the last was the most famous, having a college, which for many years rivalled the schools of Armagh and Lismore. The foundation of the abbey of Newry for Cistertian monks, by Maurice Mac Loughlin, king of Ireland, in 1153, is the most interesting event connected with Down prior to the English invasion, as the charter is still extant (O'Connor's *Rer. Hib. Scrip. Vet. Proleg.* ii., 153), witnessed by the celebrated primate Gelasius and by the petty kings of most of the northern provinces. The lands are conveyed with their woods, waters, and mills.

Down was overrun by the English under John de Courcy in 1177. The chief families introduced by the conquest were the Savages, Whites, Riddles, Sendalls, Poers, Chamberlains, Stokes, Mandevilles, Jordans, Stauntons, Logans, Papelaws, Russels, Audleys, Copelands, Martells. Of these the Savages, Whites, and Russels still remain: most of the other names have become extinct in consequence of subsequent conquests by the Irish, and forfeiture. The county was originally divided into two shires, Down, and Newtown or the Ards, to which sheriffs were regularly appointed until 1333, when the revolt of the Irish on the murder of William de Burgho [BELFAST] overturned the English authority throughout Ulster. The family of Savage, who had possessed the baronies of Ards and Castlereagh, were driven into the peninsula between Loch Strangford and the sea, and the Whites, who had held the centre of the county, were confined to that part of Dufferin which borders on Loch Strangford on the west. Castlereagh fell into the hands of the O'Neills; Kinelearty into those of the Mac Artanes and Mac Rory and Magennis obtained the whole of Upper and Lower Iveagh. Lecale and Mourne, being protected until the middle of the seventeenth century by the castles of Ardglass, Dundrum, and Green Castle, held out against the natives, and having a sea communication with Louth, were considered as part of that county, while the rest of Down remained without the pale.

The Whites and Savages being separated from the English fell soon after into Irish habits, but still maintained an independence among the hostile tribes around them. Ardquin in Upper Ards, and Killileagh on the shore of Loch Strangford, were their respective places of defence. The attainder of Shane O'Neill, who was slain in rebellion in 1567, threw all Iveagh, Kinelearty, Castlereagh, and Lower Ards into the hands of the Crown. The dissolution of religious houses had already enabled the government to place an English colony at Newry, which had been granted to the family of Bagnall, and an attempt was made in 1572 to occupy the Ards and Castlereagh with a similar force under the family of Smith: but the son of Sir Thomas Smith, who led the expedition, being killed by Neal Mac Brian Artagh, one of the attainted O'Neills, the project miscarried. Some indulgence was now shown to the O'Neills, Magennises, and Mac Artanes, who upon submission acquired grants of their estates. In 1602, however, O'Neill of Castlereagh being seized on some slight pretext, and imprisoned in Carrickfergus Castle, contrived to make his escape by the assistance of one Montgomery, the brother of a Scotch knight of some fortune, who afforded the fugitive protection on his arrival in Scotland, and afterwards negotiated his pardon on the terms of having the greater part of O'Neill's estate made over to himself and Mr. Hamilton, his associate in the proceeding. The colony led over by Sir Hugh Montgomery settled chiefly about Newtownards and Greyabbey, along the north-eastern coast between Strangford Loch and the sea, and by their enterprize and industry soon raised that part of the county to a very flourishing condition. The general plantation of Ulster soon after gave security to their improvements. Sir Hugh was raised to the rank of viscount; and his colony proved of the greatest service during the subsequent wars which commenced with the rebellion of 1641. The family of Hamilton settled at Bangor and Killileagh. That of Hill, which about the same time acquired large estates in the north of the county, settled in the neighbourhood of Belfast, and soon after their arrival laid the commencement of a town at Hillsborough, the residence of their present representative, the marquis of Downshire. The forfeitures consequent on the rebellion of 1641 and the war of the revolution deprived almost all the old Irish and Anglo-Norman families of their estates. Magennis, Lord Iveagh, was the chief sufferer by the first; the Whites, Russels and Savages, were the principal families affected by the latter. At present the fee of the county is almost entirely in the hands of Protestant proprietors of English and Scotch descent.

Of the Pagan antiquities of Down, the most remarkable is a stone cromlech, inclosed by a circular ditch of extraordinary dimensions, called the Giant's Ring, near Shaw's Bridge, half way between Lisburn and Belfast. The inclosure is nearly half an English mile in circumference; and the rampart is still from 12 to 14 feet in height. There are stone monuments of the same character at Sliddeny Ford, near Dundrum, and Legaraney in the parish of Drumgoolan. There is a remarkable cairn, or sepulchral pile of stones, on the top of Slieve Groob. The main pile is 77 yards in circumference at bottom, 45 yards at top, and 54 feet high at its greatest elevation: there are twenty-two smaller cairns raised on the top. Along the Armagh boundary of Down there extends a great earthen rampart, called by the people of the country the Danes' Cast, and sometimes Tyrone's ditches. The native Irish call it *Glin na muic duibh*, or the Glen of the Black Pig, which is the name applied by the lowland Scotch to the wall of Antoninus. The Danes' Cast measures from 80 to 50 feet across, and occurs at intervals along the line of the Newry canal from the lands of Lisnagade, where it commences, near Scarvagh in Down, to the neighbourhood of Forkhill in the county of Armagh, west of which it has been traced to a great distance by the officers of the Ordnance Survey. Its origin is quite unknown. There are numerous raths or earthen entrenched mounds throughout Down, of which the most remarkable are at Downpatrick, Donaghadee and Dromore. Of the Anglo-Norman military antiquities of Down, the castle of Dundrum is the most important. It is imposingly situated on a rock over the bay, and consists of a circular keep with numerous outworks. It is said to have been built by De Gourcy for the knights templars, who occupied it till the suppression of that order in 1313, when it was granted to the prior of Down. In 1517 it was taken from the Irish, who had seized it some time before, by Gerald earl of Kildare; and again in 1538 by the Lord Deputy Grey, with seven other castles in Lecale. It afterwards got into the hands of the Magennises, who held it for Shane O'Neill, who is said to have usually kept 200 tons of wine in his cellars here. In 1601 it was taken from Ever Magennis by the lord deputy Mountjoy, and was finally dismantled by order of Cromwell during the progress of the war of 1641. It is now the property of the marquis of Downshire, as representative of Lord Blundell, to whom it came through the earl of Ardglass after its forfeiture by the Magennises. Green Castle in Mourne was a place of great importance in the early history of Ulster. In 1495 it was deemed so important a post, that none but an Englishman was permitted to be warden. The castle of Newcastle was built by Felix Magennis in 1588, and is still inhabited. The Magennises had castles also at Castlewellan and Rathfriland. There are extensive military remains at Ardglass, and the castles of Killileagh, Ardquin, Portaferry, Bangor, and Hillsborough, are the most important of those still standing. There are also some remains of the fortifications erected by General Monk for the defence of the passes into Armagh at Scarvagh, Poyntz, and Tuscan passes.

The chief ecclesiastical remains in Down are at Downpatrick, where there are the ruins of the cathedral, and of three other religious houses. The cathedral was 100 feet in length; the roof of the centre aisle was supported by five arches of fine proportions. Prior to 1790, a round tower 66 feet in height stood at the western end: it was taken down at the time of the partial rebuilding of the cathedral; and it is worthy of remark, that part of the wall of some more antient edifice was found to run below its foundations. There is another round tower at Drumbo, near Belfast. There are a few remains of the abbey of Bangor; and at Greyabbey there is still standing in good preservation a part of the antient abbey founded here in 1192 by Africa, daughter of the king of Man, and wife of De Courcy.

A mile and a half to the east of Downpatrick is a hill about 150 feet high, called Strual mountain, celebrated all over Ireland for the resort of the lower orders of Roman Catholics, who come here every Midsummer for the performance of penance. The ceremonies commence by the penitents climbing Strual mountain on their knees, with a large stone placed on the back of the neck, three, seven, or nine times, according to the circumstances of the case: after this they are turned thrice round in a stone seat called St. Patrick's chair, by a person who in 1830 used to come annually from the county of Mayo for the purpose of presiding over this part of the ceremony. The penitents then descend to a neighbouring plain, where they bathe promiscuously in a well dedicated to St. Patrick, and conclude by drinking from another well. Tents are erected in the adjacent fields, and the evening is generally spent in dissipation.

Education has made rapid progress since 1821; in that year the number of young persons receiving instruction was 9521; in 1824 it was 14,111; and in 1834 the number of young persons receiving daily instruction, in the two dioceses of Down and Dromore, which are together very nearly co-extensive with the county, was 36,446. These dioceses stand respectively fourth and twelfth in educational rank among the thirty-two dioceses of Ireland. According to Mr. D'Alton's return of funds designed for educational purposes in Ireland, the annual amount so designed in Down is 1092*l.* 2*s.* 8½*d.*; the acreable possessions of the different schools is seventy-one acres, and the amount contributed by the National Board of Education is 645*l.* per annum.

County expenses are defrayed by grand jury presentments: average amount so levied during the twenty years preceding 1830, 31,000*l.* Down pays 13,817*l.* 9*s.* 6*d.* as share of the original expense of the district lunatic asylum at Belfast, and a share of the annual expense proportioned to its population. Two newspapers are supported at Newry: the number of stamps issued to these in 1831 was 122,600; and in 1836 the number was 121,961. The gross produce of customs' duties collected within the Newry and Strangford district in the year 1835 was 53,902*l.* 4*s.* 7*d.*

(Harris's *History of Down*, Dublin, 1744; *Statistical Survey of Down*, Dublin, 1802; Inglis's *Ireland in* 1834; *Report on Irish Fisheries*, 1837; *Reports on Education in Ireland*, 1837; Cox's *History of Ireland*.)

DOWN, a bishop's see in the ecclesiastical province of Armagh in Ireland. The chapter, which is regulated by patent of James I., consists of dean, precentor, chancellor, archdeacon, and two prebendaries. With the exception of part of one parish lying in Antrim, this diocese is situated entirely in the county of Down, of which it occupies the eastern portion. It extends in length from south-west to north-east 51 English miles, by 28 miles in breadth from east to west. It contains 42 parishes, constituting 37 benefices. In 1792 the number of churches was 33; and in 1834 the numbers were, churches of the establishment 40, Roman Catholic 37, Presbyterian 56, other places of worship 19. In the same year the gross population of the diocese was 188,558, of whom there were 27,662 members of the established church, 58,405 Roman Catholics, 98,961 Presbyterians, and 3,530 other Protestant Dissenters, being in the proportion of rather more than two Protestants of whatever denomination to one Roman Catholic. There were at the same time in this diocese 309 daily schools, educating 19,459 young persons, being in the proportion of 10.26 per cent. of the entire population under daily instruction, in which respect Down stands fourth among the 32 dioceses of Ireland. Of the above schools 46 were in connection with the National Board of Education.

The see of Down was founded about the end of the fifth century by St. Patrick, who appointed Cailin, abbot of Antrim, to the bishopric. The first episcopal seat was at Downpatrick, then called Aras Keltair and Rath Keltair, where it continued until after the plantation of Ulster in the reign of James I., when the church of Lisburn was by letters patent constituted the cathedral of the united diocese of Down and Connor; but the original episcopal seat was restored to Downpatrick by act of parliament about 1790. The most distinguished bishop of Down, prior to the English invasion, was Malachy O'Morgair, who succeeded in 1137, and assisted the Primate Gelasius in the introduction of the Roman discipline. In 1442, the union of Down with the see of Connor took place in the person of John first bishop of the united diocese. Among his successors, those of most note were, Leslie, bishop during the wars of 1641, and the celebrated Doctor Jeremy Taylor, who succeeded in 1660. From 1441 down to the end of the last century there has been no episcopal residence attached to this see. Doctor Taylor generally resided at Portmore, near Glenavy, in the county of Antrim. The present episcopal mansion stands within a mile of Holywood, on the eastern shore of Belfast Loch. The same ecclesiastical immunities are claimed by the Paget family for their manor of Mourne in this diocese as by the Needham family for their Lordship of Newry [DOWN] in the diocese of Dromore; but this claim has always been resisted by the bishops of Down. By act 3rd and 4th William IV. c. 37, the united diocese of Down and Connor is further augmented by the diocese of Dromore.

(Beaufort's *Memoir of a Map of Ireland*; Ware's *Bishops*; *Reports of Commissioners*, &c.)

DOWNING COLLEGE, CAMBRIDGE. The sole founder of this college was Sir George Downing, Bart., of Gamlingay Park, in Cambridgeshire, who by will dated 20th December, 1717, devised estates in the counties of Cambridge, Bedford, and Suffolk, first to Sir Jacob Gerard Downing, and afterwards to other relations in succession, and in failure thereof, to build and found a college in this university, upon a plan to be approved of by the two archbishops and the masters of St. John's and Clare Hall. This direction was the reason for giving them the power which they possess in elections and other matters by the charter and statutes.

Sir George died in 1749 and Sir Jacob in 1764, and (the other devisees having previously died without issue) upon this event the foundation ought to have been immediately carried into execution. But the estates were in the possession of Lady Downing, and afterwards of her devisees, without any real title; and when the university sued in chancery for the establishment of the college, the party in possession resisted the suit in that court. In 1769 a decree was obtained in favour of the foundation.

The persons named as trustees in the founder's will having died in his lifetime, the execution of the trusts devolved upon the heirs-at-law; who, after combating a long series of opposition and litigation, and overcoming obstacles of various descriptions, preferred a petition to the crown for a charter; and at length, in 1800, the privy council decided to recommend the foundation to his majesty.

On 2nd September, 1800, the great seal was affixed to the charter by Lord Loughborough: by this charter the college is incorporated with all the privileges belonging to any college in the university, and endowed with the estate devised by the founder, with a power to hold landed property (in addition thereto) to the value of 1500*l.* per annum.

The charter directs statutes to be framed for the government of the college, which was done in July, 1805, and shortly afterwards the stipends of the members began to be paid. By the statutes, no beneficial leases of the college estates are allowed, nor any fine to be taken for a grant or renewal. It is also provided that no new foundation shall ever be engrafted on this college which shall be inconsistent with the charter and statutes. But the college may accept any additions to their property in augmentation of the number or value of their present appointments, or to be applied in any other manner consistent with their present constitution. There is also a power given to the four electors and the master to alter the statutes, on application by a certain portion of the college.

A piece of land, nearly thirty acres, having been purchased for the site, and for grounds and walks, on the 18th May, 1807, the first stone was laid; since which time the building has proceeded at intervals, at the expense of about 60,000*l.* In 1821 buildings sufficient for opening the college, and comprizing nearly two sides of a large court, were completed; and in May, 1821, undergraduates were admitted to reside and keep terms.

This college will consist of a master, two professors (one of the laws of England and one of medicine), sixteen fellows (two of which only are clerical), and six scholars. The objects of the foundation are stated in the charter to be students in law, physic, and other useful arts and learning. At present only the master, professors, and three fellows, are appointed, for the purpose of taking possession of the estates, administering the revenues, superintending the building of the college, and for the other necessary purposes. The appointment of the remaining fellows is reserved until after the erection of the buildings necessary for the college. The scholars will also be elected after that period; but not more than two in each year. There are also two chaplains nominated by the master.

The master is elected by the archbishops of Canterbury and York, and the masters of St. John's and Clare Hall, from among those who have been professors or fellows. The electors to professorships are the same as to the mastership, with the addition of the master. The electors to the fellowships are, the master, professors, and fellows of the degree of M.A. After the building of the college is completed, the elections will be annually on the 21st of February. While the college remains uncompleted, the elections to fellowships are at uncertain times, depending upon vacancies. The clerical fellowships are to be tenable for life: the lay fellowships to continue only for twelve years. The present master is the Rev. Thomas Worsley, M.A., elected 1836; and the number of members upon the boards of the college forty-nine. The rectory of East Hartly, and the vicarage of Tadlow, both in the county of Cambridge, are in the patronage of this college.

(Ackermann's *Hist. of the Univ. of Cambridge*, 4to, Lond. 1815, vol. ii. p. 283—288; *Cambridge Univ. Calendar* for 1837.)

DOWNPATRICK, the assize town of the county of Down, in Ireland, distant from Dublin 73 Irish or 93 English miles; situated in the barony of Lecale, one mile to the south of the Quoil river, which opens into the south-western angle of Strangford Loch about four miles to the east. Downpatrick is the seat of a bishopric, and returns a member to the imperial parliament. Constituency, 525.

The boundaries of the borough embrace an extent of 1486 statute acres, containing 897 houses, of which 237 are thatched and 660 are slated: of the latter 285 are estimated to be worth 10*l.* per annum.

Downpatrick takes its name from St. Patrick, who is stated in many antient records to have been buried here. Before his time the place was called Rath Keltair and Dun-da-leth-glass, from an earthen fortification, the ruins of which still cover a considerable space, and present an imposing appearance on the north-west of the town. On the conquest of Ulster by the English in 1177, De Courcy made Downpatrick his head-quarters, and it continued in the hands of the English until about the time of the rebellion of Shane O'Neill, in 1567, when it fell into the hands of the Irish, but was retaken by Sir Richard Morrison soon after.

The town is pleasantly situated in a rich, undulating country, surrounded by hills. There is a good court-house, a ruined cathedral, one church, two Roman Catholic chapels, a Presbyterian meeting-house, a Methodist do., and a good market-house and gaol. An hospital was founded here about 1740, by Mr. Southwell, for the reception of decayed tenants. The provisions of the Paving and Lighting Acts were put in force here in 1829, since which time the town has been lighted with oil: expense, about 360*l.* per annum.

There are branches of the northern banking company, and of the provincial bank of Ireland at Downpatrick.

There are ten schools with small endowments within the deanery; a diocesan school, to which the bishop and clergy subscribe 90*l.* per annum; and a gaol school supported by the county; besides a male and female school, supported by Lady Harriet Forde, and twenty-four other schools: total number of young persons under instruction, 897 males and 462 females.

Population in 1821, 4123; in 1831, 4784. [Down.]

DOWNS or **DUNES**, are little hillocks of sand formed along the seacoast.

The mode of their formation is this:—the waves of the sea, in certain localities, drive upon the beach a certain quantity of fine sand, which, becoming dry during low water, is carried up still higher by the wind, till meeting with the obstruction of large stones, bushes, tufts of grass, &c., it is accumulated into little heaps; these offering still greater surfaces of resistance as the sand increases upon and against them, soon rise into mounds of considerable height, whose number, arrangement, and dimensions, depend naturally upon the size and distribution of the obstacles to which they owe their existence. If these obstacles are close set, there will be little more than one range of sand hillocks, and, if very close, these will in time unite so as to form a continuous ridge. Should the arresting objects, on the contrary, be thinly scattered, and at different distances from the brink on a shelving coast, there will be several ranges of hillocks, the one behind the other.

The downs having attained a certain height, the wind has no longer the power to increase their elevation, and they are then urged forward upon the land.

The way in which this is effected is easily conceived. On the windward side of the hillocks the grains of sand are forced up to the top, whence they are swept off as they arrive, and fall by their own weight on the opposite slope. Thus the mass goes on invading the land, while fresh material is constantly brought by the sea.

This progress inland depends however upon the habitual direction of the wind and the relative direction of the coast-line. In Gascony the sand advances eastward, and generally along the whole coast of France, from Bayonne to Calais, the downs progress in a north-easterly direction, the wind blowing most frequently from the south-west; whereas from Calais to Dunkerque, the coast trending in the direction of the wind, they make no progress inland, but form a ridge or chain parallel with the coast.

The rapidity with which the sands advance is, in some cases, most alarming. Between the mouths of the Adour and the Garonne their progress is about sixty feet yearly; nor is it easy to arrest their march. The town of Mimizan is in part buried under the sands, against whose encroachment it has been struggling for the last five-and-twenty years. In Brittany also, a village near St. Pol de Leon has been entirely covered with the sand, so as to leave no part visible but the steeple of the church.

In the Boulonnais the advance of the downs has been almost wholly arrested since the works there executed by [illegible]. The inhabitants plant a species of cyperaceæ (the *Arundo arenaria*) termed by them *oya*, which thrives well, and fixes the sands. This process is so much the more advantageous, as every hillock which becomes fixed is an effectual barrier against the invasion of fresh sand from the sea.

In Gascony the peasants force the wind, in some measure, to drive back what it brought. Thus, when the wind blows in a direction contrary to that which pushes the downs upon the land, they toss the sand high into the air with shovels, and in this manner get rid of a portion of it: this portion, however, is very small, and the prevailing winds being from the south-west the sands continue to advance in spite of all their efforts.

Downs sometimes intercept the flow of water to the sea, forming stagnant pools between and behind them which give rise to an aquatic vegetation and the occasional formation of a kind of peat.

DOWNTON. [Wiltshire.]

DOXOLOGY, a form of giving glory to God, from the Latin *doxologia*, and that from the Greek *doxa* (δόξα), glory, and *logos* (λόγος), a word or saying. The doxology in the concluding paragraph of the Lord's Prayer, 'Thine is the kingdom, and the power, and the glory,' is left out of many of the ancient copies of St. Matthew's Gospel, though it appears in others; St. Luke omits it entirely. The authenticity of this form of praise, as a paragraph of the prayer, has been a difficult subject of dispute. It does not appear in the Vulgate, but it seems to be established by the Greek MSS. and the Eastern versions. Doxology is also used for the short hymn, *Gloria Patri*, which we use in our church service at the end of every psalm, of every part of the hundred and nineteenth psalm, and of every hymn except *Te Deum*, which is a doxology of itself. Durand and other writers consider this exception to have been introduced into the Romish church by St. Jerome. The first express mention of it is in the second council of *Vaison*, A.D. 529. Amongst the Christians it was always considered as a solemn profession of their belief in the Trinity. (Wheatly *on the Common Prayer*, 8vo. Oxf. 1802, pp. 131, 132; Broughton's *Dict. of all Religions*, pp. 341, 342.)

DRACÆNA, a genus of endogenous plants, of the natural family *Asparageæ* of Jussieu, now arranged as a section of Liliaceæ by Dr. Lindley. The genus was established by Linnæus, and named from one of its species yielding the resinous exudation, familiarly known by the name of Dragon's blood, a translation of the Arabic name *dam al akh-wain*, met with in Avicenna and other Arabian authors. Dracæna is characterized by having an inferior six-partite perianth, of which the segments are nearly erect, and have inserted on them the six stamens, with filaments thickened towards the middle and linear anthers. The style is single, with a trifid stigma. The berry two or three-celled, with its cells one or two-seeded.

The species of Dracæna are now about 20 in number, and found in the warm parts of the Old World, and in many of both Asiatic and African islands, whence they extend southwards to the Cape of Good Hope and New Holland, and northwards into China, and to the eastern parts of India, as the districts of Silhet and Chittagong. Species are also found in Socotra, and the Canary and Cape Verd Islands, as well as at Sierra Leone. From this distribution it is evident that the species require artificial heat for their cultivation in England. They are found to thrive in a light loam, and may be grown from cuttings sunk in a bark bed.

The species of Dracæna are evergreens, either of a shrubby or arboreous nature; and having long, slender, often columnar stems, they emulate palms in habit. Their trunks are marked with the cicatrices of fallen leaves; the centre is soft and cellular, having externally a circle of stringy fibres. The leaves are simple, usually crowded together towards the end of the branches, or terminal like the inflorescence: whence we might suppose that the name *terminalis* had been applied to some of the species, if Rumphius had not stated that it was in consequence of their being planted along the boundaries of fields. The structure of the stem and leaves is particularly interesting, as the fossil genera Clathraria and Sternbergia have been assimilated to Dracæna, the former by M. Adolphe Brongniart, and the latter by Dr. Lindley; and as Rumphius compares the leaves of a Dracæna with those of Galanga, it is as probable that the fossil leaves called Cannophyllites may be those of a plant allied to Dracæna, as that they belong to one of the Canneæ.

Of the several species of Dracæna which have been described by botanists, there are few which are of much importance either for their useful or ornamental properties. Among them, however, may be mentioned D. terminalis, a species rather extensively diffused. The root is said by Rumphius to be employed as a demulcent in cases of diarrhœa, and the plant as a signal of truth and of peace in the Eastern archipelago. In the Islands of the Pacific Ocean a sweetish juice is expressed from its roots, and afterwards reduced by evaporation to a sugar, of which specimens were brought to Paris by Captain D'Urville from the island of Tahiti (Otaheite). The root is there called Ti or Tii, and thence no doubt corrupted into *Tee-root* by the English and Americans. M. Gaudichaud mentions that in the Sandwich Islands generally an intoxicating drink is prepared from this root, to which the name *Ava* is often applied, as well as to that made with the roots of Piper methysticum.

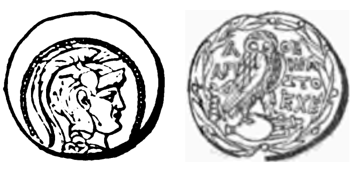
Dracæna Draco is the best known species, not only from its producing Dragon's blood, but also from one specimen having so frequently been described or noticed in the works of visitors to the Canary Islands. The erect trunk of the Dragon-tree is usually from 6 to 12 feet high, and divided above into numerous short branches, which terminate in tufts of spreading sword-shaped leaves, pointed at the extremity. The most celebrated specimen of this tree grows near the town of Orotava, in the Island of Teneriffe, and was found by Humboldt in 1799 to be about 45 feet in circumference. Sir G. Staunton had previously stated it to be 12 feet in diameter at the height of 10 feet; and Ledru gave even larger dimensions. It annually bears flowers and fruit, and though continuing thus to grow, does not appear much increased in size, in consequence of some of its branches being constantly blown down, as in the storm of July 1819, when it lost a great part of its top. The great size of this enormous vegetable is mentioned in many of the older authors; indeed as early as the time of Bethencourt, or in 1402, it is described as large and as hollow as it is now; whence, from the slowness of growth of Dracænas, has been inferred the great antiquity of a tree which four centuries have so little changed. Humboldt, indeed, remarks that there can be no doubt of the Dracæna of Orotava being with the Baobab (Adansonia digitata) one of the oldest inhabitants of our planet, and as tradition relates that it was revered by the Guanches, he considers it as singular that it should have been cultivated from the most distant ages in the Canaries, in Madeira, and Porto Santo, although it comes originally from India. This fact he adduces as contradicting the assertion of those who represent the Guanches as a race of men completely isolated from the other races of either Asia or Africa. To this it may be replied, that we know too little of the Botany of the interior of Africa to be able to draw from it any inferences; while the Dragon-tree on the other hand is not known to exist further to the eastward than the island of Socotra.'

DRACHM, or **DRAM**, a small measure of weight, the etymology of which is to be found in the Greek drachma (δραχμή). The drachm of our pound troy is stated to be nearly the same as the Attic drachma, or the Roman denarius (under the earlier emperors).

There are two drachms or drams remaining in our system of weights; the first is the sixteenth part of the ounce, which is the sixteenth part of the pound avoirdupois of 7000 grains: this is now totally out of use, as no species of goods which are weighed by the avoirdupois weight are of such value as to make the sixteenth part of an ounce worth consideration. In the national standard, the troy pound of 5760 grains, there is no dram; but this weight occurs in that particular division of the troy pound which is used by apothecaries, in which the dram is the eighth part of the ounce, which is the twelfth part of the pound of 5760 grains. This is the real remnant of the Roman division; the denarius (which, according to Pliny, was the Attic drachma of his time) was, however, the *seventh* part of the ounce. The drachma or dram is used in England, France, Holland, Prussia, and in some parts of the Levant.

DRACHMA, from the Greek *drachme* (δράχμη), a silver coin. It was the chief coin in use among the Athenians, and probably other Greeks also. The didrachm or two drachms, the tridrachm or three drachms, and the tetradrachm or four drachms, were its multiples. The last was the largest form of Greek silver. The average weight of five drachmæ in the British Museum is 60.92 grains; and the average weight of three tetradrachmæ in the British Museum is 260.56 grains. The Attic drachma has been supposed to have been the same among the Greeks with the denarius among the Romans: others have disputed this; but both may be reconciled by the consideration that the number of drachmæ, as well as of denarii, which went to the ounce might have been subject to occasional variations.

(Pitisci *Lexicon Antiq. Gr. et Rom.*, *v.* Denarius; Pinkerton's *Essay on Medals*, vol. i., § 6; Kelly's *Universal Cambist*, 4to., Lond., 1821, vol. i., 3, 4. 9. 30. 34, &c.; vol. ii. 256.)



Drachma.

British Museum. Actual size. Silver. Weight, 61$\frac{6}{10}$ grains.

DRACI'NA, the name given by Melandri to the colouring matter of dragon's blood, and which he supposed to be a vegetable alkali; but Berzelius and Herberger are of opinion that it does not possess alkaline properties: the last-mentioned chemist, indeed, calls this colouring matter *draconin*, and he considers it to possess rather sub-acid properties than such as denote alkalinity.

DRACO, an Athenian legislator, who flourished about the 39th Olympiad., 621 B.C. Suidas tells us that he brought forward his code of laws in this year, and that he was then an old man. Aristotle says (*Polit.* ii. at the end), that Draco adapted his laws to the existing constitution, and that they contained nothing peculiar beyond the severity of their penalties. The slightest theft was punished capitally, as well as the most atrocious murder; and Demades remarked of his laws, that they were written with blood, and not with ink. (Plutarch, *Solon*, cxvii.) Draco, however, deserves credit as the first who introduced written laws at Athens, and it is probable that he improved the criminal courts by his transfer of cases of bloodshed from the archon to the ephetæ (Jul. Pollux, viii. 124, 125), since before his time the archons had a right of settling all cases arbitrarily, and without appeal, a right which they enjoyed in other cases till Solon's time. (Bekker's *Anecdota*, p. 449, l. 23.) It appears that there were some offences which he did not punish with death; for instance, loss of the civil rights was the punishment for an attempt to alter one of his laws. (Demosth. *c. Aristocr.*, p. 7[illegible]4, Bekk.) Draco was archon (Pausan. ix. 36, § 8), and consequently an eupatrid: it is not therefore to be supposed that his object was to favour the lower orders, though his code seems to have tended to abridge the power of the nobles. He died in the island of Ægina. On the legislation of Draco in general, see Wachsmuth, *Hellenische Alterthumskunde*, ii. 1, p. 239, and following.

DRACO (the dragon), one of the old constellations, referred by Higinus to the fable of the Hesperides. It is constantly stated by the older writers as being placed between Ursa Major and Ursa Minor, which hardly suits the present position of the constellation, since its principal stars are all contained between Ursa Minor, Cepheus, Cygnus, and Hercules. The two stars in the head (β and γ, the latter celebrated as passing very near the zenith of the south of England, and as being the one used in the discovery of aberration [BRADLEY],) are nearly in the line joining α Cygni (Deneb) and Arcturus; while seven or eight smaller stars wind round Ursa Minor in such a manner as to render the name of the constellation not unappropriate. The extreme star (λ) is very nearly between the pole star and its pointers. [URSA MAJOR.] The principal stars are as follows:—

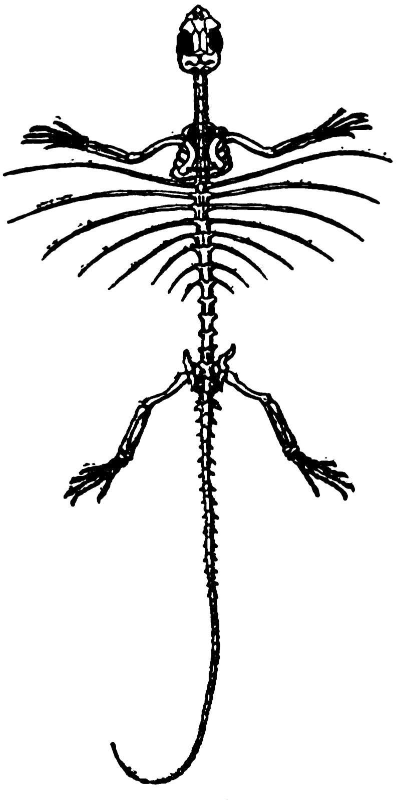
Character.	No. in Catalogue of Flamsteed and Piazzi.	No. in Catalogue of Astron. Society.	Magnitude.	Character.	No. in Catalogue of Flamsteed and Piazzi.	No. in Catalogue of Astron. Society.	Magnitude.
λ	1	1350	3½	b	39	2131	5
κ	5	1450	3	χ	44	2143	4
i	10	1686	5	c	46	2172	5
α	11	1607	3½	o	47	2192	4
ι	12	1756	3		48	2203	6
θ	13	1842	3	υ	52	2209	4
η	14	1892	3	(n)	53	2234	5
A	15	1903	4	(p)	54	2243	5
g	18	1918	5	δ	57	2253	3½
h¹	19	1950	5	π	58	2274	4
μ	21	1962	4½	τ	60	2272	4½
ζ	22	1977	4	σ	61	2306	4½
β	23	2016	2½		66	2374	6
ν¹	24	2022	5½	ρ	67	2371	5
ν²	25	2023	5½		76	2496	5
f	27	2030	5	(z)	78	2595	5
ω	28	2041	4		(10)	1404	5
ξ	32	2059	3		(37)	1135	3
γ	33	2071	2		(191)	2843	5
	36	2111	6		(380)	2084	3

DRACONIN, the *dracina* above mentioned, may be [illegible]tained, according to Melandri, by macerating dragon's [illegible] in water acidulated with sulphuric acid: this becomes [illegible] yellow colour, but does not act upon the draconin, which [illegible] of a fine red colour and very fusible: it may be worked between the fingers, and drawn into threads. It melts at [illegible] 130°: on solidifying it becomes of a crimson colour, [illegible] when triturated gives a cinnabar red colour. It dissolves readily in alcohol, and the solution, which is of a fine [illegible] becomes yellow on the addition of an acid; but on the addition of an alkali the red colour is restored. It does not appear to have been analysed.

DRAGOMANS, or DROGOMANS (from the Turkish *Trukéman*); the interpreters attached to the European consulates and embassies in the Levant are so called. At Constantinople they are the chief, and in most cases the sole medium of communication between Christian ambassadors, who are ignorant of the Turkish language, and the Ottoman Porte. They are men born in the country, and are chiefly descended from old Genoese or Venetian settlers. Their local interests and sympathies have often interfered with their duties; and though there have been honourable exceptions, they are not distinguished as a body for honour and integrity. The French, as early as the time of Louis XIV., saw the propriety of employing native subjects in this capacity, and instituted a small body of young men, technically called *Jeunes de langue*, who were sent to the country to learn the language and acquaint themselves with its laws and customs. But this good plan has not been sufficiently supported. The dragomans and their families enjoy the protection of the nations whom they serve, and are exempted from Turkish law.

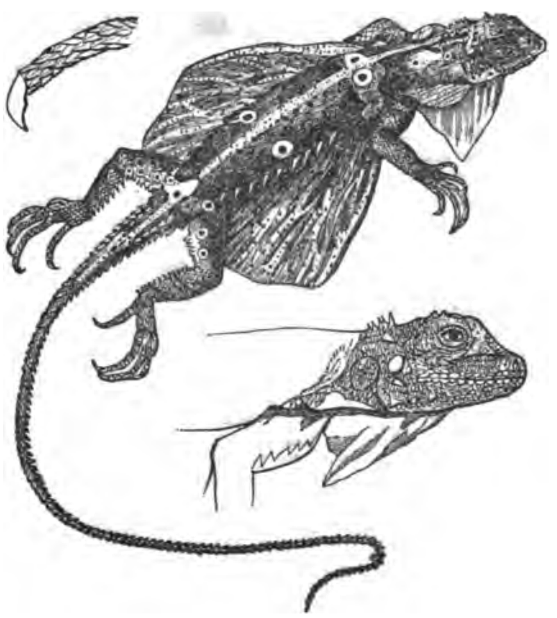
DRAGON. DRAGO'NIDÆ, a family of Saurians, distinguished from their congeners in having their six first false ribs, instead of hooping the abdomen, extending in a nearly straight line, and sustaining a production of the skin which forms a kind of wing comparable to that of the bats, but independent of the four feet. This wing sustains the animal like a parachute when it leaps from branch to branch, but does not possess the faculty of beating the air, and so raising the reptile into flight like a bird. All the species are small, covered entirely with small imbricated scales, of which those of the tail and limbs are carinated. The tongue is fleshy, but slightly extensile, and slightly jagged (echancrée). Under the throat is a long pointed production (fanon), sustained by the hind part (queue) of the os hyöides, and at the sides are two other smaller ones, sustained by the horns of the same bone. The tail is long. The thighs have no pores. On the nape is a small dentilation. In each jaw are four small incisors, and on each side a long and pointed canine, and twelve triangular and trilobated molars.

Cuvier, whose description this is, says that the dragons have the scales and the gular appendage of the *Iguanas*, with the head and teeth of the *Stellionidæ*.



Skeleton of Dragon.

Geographical Distribution.—The known species which Daudin first extricated from confusion come from the East Indies.



Draco fimbriatus.

DRAGON'S BLOOD. [Calamus.]

DRAGOON. [Cavalry.]

DRAGUIGNAN, a town in France, capital of the department of Var. It is on the river Pis, or Nartuli, or Artuby, which falls into the Argens, 416 miles in a straight line south-south-east of Paris, or 552 miles by the road through Lyon, Valence, Avignon, Aix, and Brignolles; in 43° 32′ N. lat., and 6° 30′ E. long.

It has been supposed by some, but without sufficient reason, that Draguignan is on the site of the Forum Voconii of the Romans: it is however a place of considerable antiquity, having been mentioned in the titles of the earliest counts of Provence. Little historical interest is attached to it. Before the Revolution there were many religious houses here: the Reformed Dominicans, Augustinian Canons, Cordeliers, Minims, and Capuchins had convents; that of the Dominicans was very handsome; and there were nunneries for Ursulines and the nuns of the Visitation. The priests of the Christian doctrine had the direction of a college, and there was a tolerably well-built hospital. The bishop of Frejus had a palace here. The town is situated in a fertile plain surrounded by an amphitheatre of hills covered with vines and olive-trees. It is tolerably well built, and not badly laid out: it is adorned with numerous and copious fountains and many rows of trees. There is a clock-tower built upon a precipitous limestone rock, which crowns a small eminence, and rises as high as the roofs of the houses. The population in 1832 was 9070 for the town, or 9804 for the whole commune: the inhabitants manufacture coarse woollen cloths, leather, stockings, silks, wax-candles, and earthenware: there are many oil-mills. The environs produce excellent fruit and wines: gypsum is abundant, and there are stone-quarries in which large blocks of stone are quarried. There are a library, a cabinet of medals, a museum of natural history, containing chiefly the minerals of the department, a botanic garden, a high school, an agricultural society, and several prisons and foundling hospitals; the foundlings are chiefly illegitimate children.

The arrondissement, which is extensive, had in 1832 a population of 86,709.

DRAIN. [Sewer.]

DRAINING. As a certain quantity of moisture is essential to vegetation, so an excess of it is highly detrimental. In the removal of this excess consists the art of draining.

Water may render land unproductive by covering it entirely or partially, forming lakes or bogs; or there may be an excess of moisture diffused through the soil and stagnating in it, by which the fibres of the roots of all plants which are not aquatic are injured, if not destroyed.

From these different causes of infertility arise three different branches of the art of draining, which require to be separately noticed.

1. To drain land which is flooded or rendered marshy by water coming over it from a higher level, and having no adequate outlet below.

2. To drain land where springs rise to the surface, and where there are no natural channels for the water to run off.

3. To drain land which is wet from its impervious nature, and where the evaporation is not sufficient to carry off all the water supplied by snow and rain.

The first branch includes all those extensive operations where large tracts of land are reclaimed by means of embankments, canals, sluices, and mills to raise the water; or where deep cuts or tunnels are made through hills which formed a natural dam or barrier to the water. Such works are generally undertaken by associations under the sanction of the government, or by the government itself; few individuals being possessed of sufficient capital, or having the power to oblige all whose interests are affected by the draining of the land to give their consent and afford assistance. In the British dominions there is no difficulty in obtaining the sanction of the legislature to any undertaking which appears likely to be of public benefit. In every session of parliament acts are passed giving certain powers and privileges to companies or individuals, in order to enable them to put into execution extensive plans of draining. That extensive draining in the counties of Northampton, Huntingdon, Cambridge, Lincoln, Norfolk, and Suffolk, which is known by the name of the **Bedford Level**, was confided to the management of a chartered corporation, with considerable powers, as early as the middle of the seventeenth century, and by this means an immense extent of land has been rendered highly productive, which before was nothing but one continued marsh or fen.

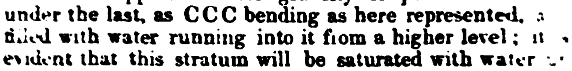
In the valleys of the Jura, in the canton of Neufchatel in Switzerland, which are noted for their industry and prosperity, and where the manufacture of watches is so extensive as to supply a great part of Europe with this useful article, extensive lakes and marshes have been completely laid dry, by making a tunnel through the solid rock, and forming an outlet for the waters. All these operations require the science and experience of civil engineers, and cannot be undertaken without great means. The greater part of the lowlands in the Netherlands, especially in the province of Holland, have been reclaimed from the sea, or the rivers which flowed over them, by embanking and draining, and are only kept from floods by a constant attention to the works originally erected.

Where the land is below the level of the sea at high water, and without the smallest eminence, it requires a constant removal of the water which percolates through the banks or accumulates by rains; and this can only be effected by sluices and mills, as is the case in the fens in England. The water is collected in numerous ditches and canals, and led to the points where it can most conveniently be discharged over the banks. The mills commonly erected for this purpose are small windmills, which turn a kind of perpetual screw made of wood several feet in diameter, on a solid axle. This screw fits a semicircular trough which lies inclined at an angle of about 30° with the horizon. The lower part dips in to the water below, and by its revolution discharges the water into a reservoir above. All the friction of pumps and the consequent wearing out of the machinery is thus avoided. If the mills are properly constructed, they require little attendance, and work night and day whenever the wind blows.

In hilly countries it sometimes happens that the waters, which run down the slopes of the hills collect in the bottoms where there is no outlet, and where the soil is impervious. In that case it may sometimes be laid dry by cutting a sufficient channel all round, to intercept the waters as they flow down and to carry them over or through the lowest part of the surrounding barrier. If there are no very abundant springs in the bottom, a few ditches and ponds will suffice to dry the soil by evaporation from their surface. We shall see that this principle may be applied with great advan-
cases where the water could not be drained out
able hollows if it were allowed to run into them.
there are different levels at which the water is
draining should always be begun at the highest;
may happen that when this is laid dry, the lower
have a great excess of water. At all events, if the water is to be raised by mechanical power, there is a saving in raising it from the highest level, instead of letting it run down to a lower from which it has to be raised so much higher.

In draining a great extent of land it is often necessary to widen and deepen rivers and alter their course; and not unfrequently the water cannot be let off without being carried by means of tunnels under the bed of some river, the level of which is above that of the land. In more confined operations cast-iron pipes are often a cheap and easy means of effecting this. They may be bent in a curve so as not to impede the course of the river or the navigation of a canal.

The draining of land which is rendered wet by springs arising from under the soil is a branch of more general application. The principles on which the operations are carried on apply as well to a small field as to the greatest extent of land. The object is to find the readiest channels by which the superfluous water may be carried off; and for this purpose an accurate knowledge of the strata through which the springs rise is indispensable. It would be useless labour merely to let the water run into drains after it has sprung through the soil and appears at the surface, as ignorant men frequently attempt to do, and thus carry it off after it has already soaked the soil. But the origin of the springs must, if possible, be detected; and one small drain or ditch judiciously disposed may lay a great extent of land dry if it cuts off the springs before they run into the soil. Abundant springs which flow continually generally proceed from the outbreaking of some porous stratum in which the waters were confined, or through natural crevices in rocks or impervious earth. A knowledge of the geology of the country will greatly assist in tracing them, and the springs may be cut off with greater certainty. But it is not these main springs which give the greatest trouble to an experienced drainer; it is the various land springs, which are sometimes branches of the former, and often original and independent springs arising from sudden variations in the nature of the soil and subsoil. The annexed diagram representing a section of an uneven surface of land will explain the nature of the strata which produce springs.



Suppose A A a porous substance through which the water filtrates readily; B B a stratum of loam or clay impervious to water. The water which comes through A A will run along the surface of B B towards S S, where it will spring to the surface and form a lake or bog between S and S. Suppose another gravelly or pervious stratum under the last, as C C C bending as here represented, and filled with water running into it from a higher level; it is evident that this stratum will be saturated with water up to the dotted line E F F, which is the level of the point of the lower rock, or impervious stratum D D, where the water can run over it. If the stratum B B has any crevices in it below the dotted line, the water will rise through these to the surface and form springs rising from the bottom of the lake or bog: and if B B were bored through and a pipe inserted rising up to the dotted line, as *c o*, the water would rise, and stand at *o*. If there were no springs at S S the space below the dotted line might still be filled with water rising from the stratum C C C. But if the boring took place at G the water would not rise, but on the contrary, if there were any on the surface, it would be carried down into the porous stratum E C C, and run off. Thus in one situation boring will bring water, and in another it will take it off. This principle being well understood will greatly facilitate all draining of springs. Wherever water springs there must be a pervious and an impervious stratum to cause it, and the water either runs over the impervious surface or rises through the crevices in it. When the line of the springs is found, as at S S, the obvious remedy is to cut a channel with a sufficient declivity to take off the water in a direction across this line, and sunk through the porous soil at the surface into the lower impervious earth. The place for this channel is where the porous soil is the shallowest above the breaking out, so as to require the least depth of drain.

but the solid stratum must be reached, or the draining will be imperfect. It is by attending to all these circumstances that Elkington acquired his celebrity in draining, and that he has been considered as the father of the system. It is however of much earlier invention, and is too obvious not to have struck any one who seriously considered the subject. In the practical application of the principle great ingenuity and skill may be displayed, and the desired effect may be produced more or less completely, and at a greater or less expense. The advice of a scientific and practical drainer is always well worth the cost at which it may be obtained.

When there is a great variation in the soil, and it is difficult to find any main line of springs, it is best to proceed experimentally by making pits a few feet deep, or by boring in various parts where water appears, observing the level at which the water stands in these pits or bores, as well as the nature of the soil taken out. Thus it will generally be easy to ascertain whence the water arises, and how it may be let off. When there is a mound of light soil over a more impervious stratum, the springs will break out all round the edge of the mound; a drain laid round the base will take off all the water which arises from the same, and the lower part of the land will be effectually laid dry. So likewise where there is a hollow or depression of which the bottom is clay with sand in the upper part, a drain laid along the edge of the hollow and carried round it will prevent the water running down into it, and forming a marsh at the bottom.

When the drains cannot be carried to a sufficient depth to take the water out of the porous stratum saturated with it, it is often useful to bore numerous holes with an auger in the bottom of the drain through the stiffer soil, and, according to the principle explained in the diagram, the water will either rise through these bores into the drains and be carried off, and the natural springs will be dried up, or it will sink down through them as at G, in the section, if it lies above. This method is often advantageous in the draining of peat mosses, which generally lie on clay or stiff loam, with a layer of gravel between the loam and the peat, the whole lying in a basin or hollow, and often on a declivity. The peat, though it retains water, is not pervious, and drains may be cut into it which will hold water. When the drains are four or five feet deep and the peat is much deeper, holes are bored down to the clay below, and the water is pressed up through these holes by the weight of the whole body of peat, into the drains, by which it is carried off. The bottom of the drains is sometimes choked with loose sand, which flows up with the water, and they require to be cleared repeatedly; but this soon ceases after the first rush is past, and the water runs slowly and regularly. The surface of the peat being dried, dressed with lime, and consolidated with earth and gravel, soon becomes productive. If the soil, whatever be its nature, can be drained to a certain depth, it is of no consequence what water may be lodged below it. It is only when it rises so as to stagnate about the roots of plants that it is hurtful. Land may be drained so much as to be deteriorated, as experience has shown.

When a single large and deep drain will produce the desired effect, it is much better than when there are several smaller, as large drains are more easily kept open, and last longer than smaller; but this is only the case in tapping main springs, for if the water is diffused through the surrounding soil, numerous small drains are more effective: but as soon as there is a sufficient body of water collected, the smaller drains should run into larger, and these into main drains, which should all, as far as is practicable, unite in one principal outlet, by which means there will be less chance of their being choked up. When the water springs into a drain from below, it is best to fill up that part of the drain which lies above the stones or other materials which form the channel with solid earth well pressed in, and made impervious to within a few inches of the bottom of the furrows in ploughed land, or the sod in pastures; because the water running along the surface is apt to carry loose earth with it, and choke the drains. When the water comes in by the side of the drains, loose stones or gravel, or any porous material, should be laid in them to the line where the water comes in, and a little above it, over which the earth may be rammed in tight so as to allow the horses to walk over the drain without sinking in.

It sometimes happens, that the water collected from springs which caused marshes and bogs below, by being carried in new channels, may be usefully employed in irrigating the land which it rendered barren before; not only removing the cause of barrenness, but adding positive fertility. In this case the lower grounds must have numerous drains in it, in order that the water let on to irrigate it may not stagnate upon it, but run off after it has answered its purpose.

The third branch in the art of draining is the removal of water from impervious soils which lie flat, or in hollows, where the water from rain, snow, or dews, which cannot sink into the soil on account of its impervious nature, and which cannot be carried off by evaporation, runs along the surface and stagnates in every depression. This is by far the most expensive operation, in consequence of the number of drains required to lay the surface dry, and the necessity of filling them with porous substances, through which the surface water can penetrate. It requires much skill and practice to lay out the drains so as to produce the greatest effect at the least expense. There is often a layer of light earth immediately over a substratum of clay, and after continued rains this soil becomes filled with water, like a sponge, and no healthy vegetation can take place. In this case numerous drains must be made in the subsoil, and over the draining tiles or bushes, which may be laid at the bottom of the drains, loose gravel or broken stones must be laid in to within a foot of the surface, so that the plough shall not reach them. The water will gradually sink into these drains, and be carried off, and the loose wet soil will become firm and dry. In no case is the advantage of draining more immediately apparent.

It is very seldom that a field is absolutely level; the first thing therefore to be ascertained is the greatest inclination and its direction. For this purpose there is an instrument essential to a drainer, with which an accurately horizontal line can be ascertained, by means of a plummet or a spirit level. A sufficient fall may thus be found or artificially made in the drains to carry off the water. The next object is to arrange drains so that each shall collect as much of the water in the soil as possible. Large drains, except as main drains, are inadmissible, since it is by the surface that the water is to come in, and two small drains will collect more than a larger and deeper. The depth should be such only that the plough may not reach it, if the land is arable, or the feet of cattle tread it in, if it be in pasture. All the drains which are to collect the water should lie as nearly at right angles to the inclination of the surface as is consistent with a sufficient fall in the drains to make them run. One foot is sufficient fall for a drain 300 feet in length, provided the drains be not more than 20 feet apart. The main drains, by being laid obliquely across the fall of the ground, will help to take off a part of the surface water. It is evident that the drains can seldom be in a straight line, unless the ground be perfectly even. They should, however, never have sudden turns, but be bent gradually where the direction is changed. The flatter the surface and the stiffer the soil, the greater number of drains will be required. It is a common practice with drainers to run a main drain directly down the slope, however rapid, and to carry smaller drains into this alternately on the right and left, which they call herring-bone fashion. But this can only be approved of where the ground is nearly level, and where there is very little fall for the main drain. A considerable fall is to be avoided as much as possible; and every drain should lie obliquely to the natural run of the water. It generally happens that, besides surface water, there are also some land springs arising from a variation in the soil; these should be carefully ascertained, and the drains should be so laid as to cut them off.

In draining clay land, where there is only a layer of a few inches of looser soil over a solid clay which the plough never stirs, the drains need not be deeper than two feet in the solid clay, nor wider than they can be made without the sides falling in. The common draining tile, which is a flat tile bent in the form of half a cylinder, and which can be made at a very cheap rate with the patent machine, is the best for extensive surface draining. In solid clay it requires no flat tile under it, it is merely an arch to carry the loose stones or earth with which the drain is filled up. Loose round stones or pebbles are the best where they can be procured; and in default of them, bushes, heath, or straw, may be laid immediately over the tiles, and the most porous earth that can be got must be used to fill the drains up: the stiff clay which was dug out must be taken away or spread over the surface; for if it were put in the drain, it would defeat the object in view by preventing the water from running into it from above. In grass land, the sod may be laid over the drain, after it has been filled up so as to form a slight ridge over it. This will soon sink to a level with the surface, and in the mean time serves to catch the water as it runs down. To save the expense of stone or tiles, drains are frequently made six inches wide at the bottom, a narrow channel is cut in the solid clay, two or three inches wide and six deep, leaving a shoulder on each side to support a sod which is cut so as to fit the drain, and rests on the shoulders: this sod keeps the earth from filling the channel; and the water readily finds its way through it, or between it and the sides of the drain. It is filled up as described before: such drains are made at a small expense, and will last for many years.

Where the clay is not sufficiently tenacious, the bottom of the drain is sometimes cut with a sharp angle, and a twisted rope of straw is thrust into it. This keeps the earth from falling in, and the running of the water keeps the channel open; the straw not being exposed to the air, remains a long time without decaying. This is a common mode of draining in Norfolk, Suffolk, and Essex.

The best materials for large main drains, where they can be procured, are flat stones which readily split, and of which a square or triangular channel is formed in the bottom of the drain. If the drain is made merely as a trunk to carry off the water, it is best to fill it up with earth, well pressed in, over the channel made by the stones; but if it serves for receiving the water through the sides or from the top, fragments of stone should be thrown over it to a certain height, and the earth put over these. A very useful draining tile is used in Berkshire and other places, which requires no flat tile under it, even in loose soils, because it has a flat foot to rest on, formed of the two thick edges of the tile, which, nearly meeting when the tile is bent round, form the foot. The section of the tile is like a horse-shoe. It is well adapted for drains where the water springs upwards, and it is less apt to slip out of its place than the common tile. They are usually made twelve or thirteen inches in length, but they are more expensive than the common tiles.

In draining fields it is usual to make the outlets of the drains in the ditch which bounds them. The fewer outlets there are, the less chance there is of their being choked: they should fall into the ditch at 2 ft. from the bottom, and a wooden trunk or one of stone should be laid so that the water may be discharged without carrying the soil from the side of the ditch. If there is water in the ditch, it should be kept below the mouth of the drain. The outlets of all drains should be repeatedly examined, to keep them clear; for wherever water remains in a drain, it will soon derange or choke it. The drains should be so arranged or turned, that the outlet shall meet the ditch at an obtuse angle towards the lower part where the water runs to. A drain brought at right angles into a ditch must necessarily soon be choked by the deposition of sand and earth at its mouth.

As the draining of wet clay soils is the only means by which they can be rendered profitable as arable land, and the expense is great, various instruments and ploughs have been contrived to diminish manual labour and expedite the work. Of these one of the simplest is the common mole-plough, which in very stiff clay makes a small hollow drain, [illegible] below the surface, by forcing a pointed [illegible] through the ground. It makes [illegible], and leaves a cylindrical channel, [illegible] which enters by the slit is carried [illegible] great power to draw it, and can only be [illegible] moist. In meadows it is extremely [illegible] need not go more than a foot under the [illegible] to ten acres of grass land may easily be drained [illegible] day. It is very apt, however, to be filled in dry [illegible] by the soil falling in; and the animals from which [illegible] its name often do much damage to it by using it [illegible] subterraneous workings.

[illegible]ing plough has been invented, which, assisted [illegible] labourers, greatly accelerates the operation of [illegible] by cutting them out in a regular manner, [illegible] immediately finished with the usual tools [illegible] done wonders in some of the wet stiff [illegible] much to be recommended in all wet [illegible] In stony land it cannot well be used. [illegible] introduced to public notice by Mr. Smith of Deanston, may be considered in some measure as a draining plough, for it loosens the subsoil, so that a few main drains are sufficient to carry off all the superfluous moisture; and it has besides the effect of not carrying off more than what is superfluous. By means of judicious drains and the use of the subsoil plough, the stiffest and wettest land may in time become the most fertile.

The tools used in draining are few and simple. Spades, with tapering blades of different sizes, are required to dig the drains of the proper width, and the sides at a proper angle. Hollow spades are used in very stiff clay. When the drain begins to be very narrow near the bottom, scoops are used, of different sizes, which are fixed to handles at various angles, more conveniently to clear the bottom and lay it smooth to the exact width of the tiles, if these are used; for the more firmly the tiles are kept in their places by the solid sides of the drain, the less likely they are to be moved. (Elkington, Stephens, Johnstone, Donaldson, Young, Marshall.)

DRAKE, SIR FRANCIS, was born in or about the year 1546, in an humble cottage on the banks of the Tavy, in Devonshire. His father, who was a poor and obscure yeoman, had twelve sons, of whom Francis was the eldest. According to Camden, who derived his information from Drake himself, Francis Russel, afterwards earl of Bedford, stood as his godfather, and John Hawkins, a distinguished navigator, defrayed the slight expenses of his short school education. In the days of persecution under Queen Mary, his father, who was known in his neighbourhood as a zealous protestant and a man of some acquirements, fled from Devonshire into Kent, where Drake was brought up; 'God dividing the honour,' says Fuller, 'betwixt two counties, that the one might have his birth and the other his education.' Under Elizabeth his father obtained an appointment 'among the seamen in the king's navy to read prayers to them;' and soon afterwards was ordained deacon, and made vicar of Upnor church on the Medway, a little below Chatham, where the royal fleet usually anchored. Francis thus grew up among sailors; and when he was yet very young, his father, 'by reason of his poverty, apprenticed him to a neighbour, the master of a bark, who carried on a coasting trade, and sometimes made voyages to Zeeland and France.' This master kept Drake close to his work, and 'pains, with patience in his youth,' says Fuller, 'knit the joints of his soul, and made them more solid and compact.' When his master died, having no children of his own, he bequeathed to young Drake the bark and its equipments. With this he continued in the old trade, and had got together some little money, and was in the fair way of becoming a thriving man, when his imagination was inflamed by the exploits of his protector Hawkins in the New World; and suddenly selling his ship, he repaired to Plymouth, and embarked himself and his fortunes in that commander's last and unfortunate adventure to the Spanish Main. In this disastrous expedition Drake lost all the money he had in the world, and suffered not a little in character; for he disobeyed orders, and deserted his superior and his friend in the hour of need. He, however, showed skilful seamanship, and brought the vessel he commanded—the Judith, a small bark of 50 tons—safe home. A chaplain belonging to the fleet comforted Drake with the assurance that, as he had been treacherously used by the Spaniards, he might lawfully recover in value from the king of Spain, and repair his losses upon him whenever and wherever he could. Fuller says, 'The case was clear in sea divinity; and few are such infidels as not to believe doctrines which make for their profit. Whereupon Drake, though a poor private man, undertook to revenge himself on so mighty a monarch, who, not contented that the sun riseth and setteth in his dominions, may seem to desire to make all his own where he shineth.' Being readily joined by a number of sea adventurers, who mustered among them money enough to fit out a vessel, Drake made two or three voyages to the West Indies, to gain intelligence and learn the navigation of those parts; but Camden adds, that he also got some store of money there, 'by playing the sailor and the pirate.' In 1570 he obtained a regular commission from Queen Elizabeth, and cruised to some purpose in the West Indies. In 1572 he sailed again for the Spanish Main, with the Pasha, of 70 tons, and the Swan, of 25 tons, the united crews of which amounted to 73 men and boys. He was joined off the coast of South America by another bark, from the Isle of Wight, with 38 men; and with these magnificent force he took and plundered the town of Nombre de Dios and made great spoil among the Spanish shipping. He partially crossed the Isthmus of Darien, and obtained a view of the great Pacific, an ocean as yet closed to English enterprise; and with his eyes anxiously fixed upon its waters, he prayed God to grant him 'life and leave once to sail an English ship in these seas.'

After some extraordinary adventures, Drake returned to England, with his frail barks absolutely loaded and crammed with treasure and plundered merchandise; and on the 9th of August, 1573, anchored at Plymouth. It was a Sunday, and the townsfolk were at church; but when the news spread further that Drake was come, 'there remained few or no people with the preacher,' all running out to welcome the Devonshire hero.

Drake being employed in the interval in the service of the queen in Ireland, was forestalled in the honour of being the first Englishman to sail on the Pacific by one John Oxenham, who had served under him as common sailor and cook; but as this man merely floated a 'pinnace' on the South Sea, and was taken by the Spaniards and executed as a pirate, he could scarcely be an object of envy.

In 1577, under the secret sanction of Queen Elizabeth, Drake departed on another marauding expedition, taking with him five vessels, the largest of which was of 100, and the smallest of 12 tons. The united crews of this miniature fleet amounted to 164 men, *gentlemen* and sailors. Among the *gentlemen* were some young men of noble families, who (not to mention the plunder anticipated) 'went out to learn the art of navigation.' After many adventures along the coasts of the South American continent, where some of his attacks were completely successful, Drake and his elated comrades came to Port Julian, on the coast of Patagonia, near the Straits of Magellanus, where they were much comforted by finding a gibbet standing—a proof that Christian people had been there before them. Drake, during his stay in Port Julian, put to death 'Master Doughtie,' a gentleman of birth and education, whose fate is still involved in some mystery, notwithstanding the laudable endeavours of Dr. Southey to rescue the fame of one of our greatest naval heroes from the suspicion of a foul murder.

On the 20th of August Drake reached Cape Virgenes, and sailed through the Strait of Magellanus, being the third navigator who performed that passage. On the 17th day after making Cape Virgenes he cleared the strait, and entered the Pacific or South Sea. Having obtained an immense booty by plundering the Spanish towns on the coast of Chili and Peru, and by taking, among many other vessels, a royal galleon called the 'Cacafuego,' richly laden with plate, he sailed to the north in the hope of finding a passage back to the Atlantic, a little above California. He reached lat. 48° N., where the extreme severity of the cold discouraged his men, and he put back ten degrees, and took shelter in Port San Francisco. After staying five weeks in that port, he determined to follow the example of Magellanus, and steer across the Pacific for the Moluccas. He made Ternate, one of the Molucca group, in safety, and thence set his course for Java.

From Java he sailed right across the Indian Ocean to the Cape of Good Hope, which he doubled without accident, and thence shaped his course homewards. He arrived at Plymouth on Sunday, the 26th September, 1579, after an absence of two years and nearly ten months, during which he had circumnavigated the globe, and spent many months on the almost unknown south-western coasts of America. Drake was most graciously received at court, and Elizabeth now asserted more firmly than ever her right of navigating the ocean in all its parts, and denied the exclusive right which the Spaniards claimed over the seas and lands of the New World. And though the queen yielded so far as to pay a considerable sum out of the treasure Drake had brought home to the procurator of certain merchants who urged, with some reason, that they had been unjustly robbed, enough was left to make it a profitable adventure for the promoters. At her orders Drake's ship was drawn up in a little creek near Deptford, there to be preserved as a monument of the most memorable voyage that the English had ever yet performed; she partook of a banquet on board the vessel, and there knighted the captain. During part of the year 1585, and the whole of 1586, Drake was actively employed against Philip II. on the coasts of Spain and Portugal, in the Canaries, the Cape de Verdes, the West India islands, and on the coast of South America, where Carthagena and other towns were taken and plundered.

In the course of this expedition Drake visited the English colony in Virginia, which had been recently planted by Raleigh, and finding the colonists in great distress, he took them on board and brought them home with him. It is said that tobacco was first brought into England by the men who returned from Virginia with Drake. In 1587, when formidable preparations were making in the Spanish ports for the invasion of England, Elizabeth appointed Drake to the command of a fleet equipped for the purpose of destroying the enemy's ships in their own harbours. This force did not exceed thirty sail, and only four were of the Navy Royal, the rest, with the exception of two yachts belonging to the Queen, being furnished by merchant adventurers. In the port of Cadiz, the first place he attacked, he found sixty ships and many vessels of inferior size, all protected by land batteries. Drake entered the roads on the morning of the 19th April, and he burnt, sunk, or took thirty ships, some of which were of the largest size; and it appears he might have done much more mischief but for the necessity he was under of securing as much booty, in goods, as he could for the benefit of the merchant adventurers. He then turned back along the coast, taking or burning nearly a hundred vessels between Cadiz and Cape St. Vincent, besides destroying four castles on shore. This was what Drake called 'singeing the king of Spain's beard.' From Cape St. Vincent he sailed to the Tagus, and entering that river, came to anchor near Cascaes, whence he sent to tell the Marquis *Santa-Cruz*, who was lying up the river with a large force of galleys, that he was ready to exchange bullets with him. The marquis, who had been appointed general of the Armada preparing for the invasion of England, and who was esteemed the best sailor of Spain, declined the challenge, and he died (the English writers say of vexation at the mischief done by Drake) before that ill-fated expedition could sail.

The operations we have briefly related delayed the sailing of that armament more than a year, and gave Elizabeth time to prepare for her defence. Having thus performed this public service, Drake bore away to the Azores, on the look-out for the treasure ships from India, and he was so fortunate as to fall in with an immense carrack most richly laden. He took it, of course, and 'the taking of this ship,' says a contemporary, 'was of a greater advantage to the English merchants than the value of her cargo to the captors; for, by the papers found on board, they so fully understood the rich value of the Indian merchandises, and the manner of trading into the eastern world, that they afterwards set up a gainful traffic, and established a company of East India merchants.' Drake generously spent a considerable part of his prize-money in supplying the town of Plymouth with good, fresh water, for hitherto there was none, except what the inhabitants fetched from a mile distance.

His next service at sea was as vice-admiral in the fleet under Charles Lord Howard of Effingham, lord high admiral of England, which, with the assistance of the elements, scattered and destroyed the 'Invincible Armada' of Spain. (ARMADA.) The seamanship of Drake, Hawkins, and Frobisher contributed largely to the happy result. In the following year, 1589, Drake was employed as admiral in an expedition sent to Portugal, in the hope of expelling the Spaniards, who had taken possession of that kingdom, by establishing the claims of Antonio, a pretender, around whom the English expected the Portuguese would rally. The whole expedition was badly planned, most miserably supplied with money and the other means of war, and but lamely executed after the landing of the troops. It was also disgraced by cruelties unusual even in that age, and inexcusable, notwithstanding the provocation which the English had so recently received on their own shores. In 1595 Drake and Sir John Hawkins, who had good experience in those parts, represented to Elizabeth that the best place for striking a blow at the gigantic power of Spain was in the West Indies; and an expedition thither was prepared, Drake and Hawkins sailing together with twenty-six ships, on board of which was embarked a land force under the orders of Sir Thomas Baskerville and Sir Nicholas Clifford. There were too many in command, and the usual bad consequences ensued. After losing time in debate they were obliged to give up an attempt on the Canaries with some loss. When they got among the West India islands Drake and Hawkins not only quarrelled but separated for some time, and before reaching the east end of Puerto Rico Hawkins died, his death being generally attributed to the agitation of his mind.

One of Drake's smallest vessels was captured by the Spaniards, who, by putting the crew of it to the torture, extracted information respecting the plans of the expedition. When Drake attacked Puerto Rico he found that place fully warned and prepared, and his desperate attack was defeated. Sailing away, he took and burned Rio de la Hacha, Rancheria, Santa Martha, and Nombre de Dios; getting no greater spoil than 20 tons of silver, and 2 bars of gold. Drake remained in the harbour of Nombre de Dios, a most unhealthy place, while Baskerville with a part of the land forces made a vain and ruinous attempt to cross the isthmus of Darien, in order to plunder and destroy the city of Panama. A fatal disease broke out among soldiers and sailors, and soon deprived them of the important services of the chief surgeon of the fleet. When many of his men and three of his captains had died, the hardy Drake himself fell sick, and after struggling some twenty days with his malady, and the grief occasioned by his failures, he expired on the 27th of December, 1595. On the same day the fleet anchored at Puerto Bello, and in sight of that place, which he had formerly taken and plundered, his body received a sailor's funeral—

> The waves became his winding sheet,
> The waters were his tomb;
> But for his fame the ocean sea
> Was not sufficient room.

So sang one of his admiring contemporaries.

Though the reputation of Drake as a skilful seaman and a bold commander was deservedly great, still, unless we judge him by the circumstances and the standard of the times, he must appear in many of his exploits in no other light than that of a daring and skilful buccaneer. (Southey, *Naval History*; Harris, *Collection of Voyages*.)

DRAKENBORCH, ARNOLD, was born at Utrecht, in 1684, studied in that university under Grævius and Peter Burmann, and at the age of 20 wrote an elaborate dissertation 'De Præfectis Urbis,' which established his reputation as a scholar. The heads of the chapters will best explain the various bearings and the classical importance of the subject. Ch. 1. is 'De Præfectis Urbis in genere,' in which the author explains the various kinds of magistrates at Rome who bore this name at different epochs, their various appellations, such as Custos Urbis, &c. 2. 'De Præfectis Urbis sub Regibus institutis,' who were appointed by several kings to take care of the city of Rome during their absence in war. Similar officers were occasionally appointed under the republic during the absence of the two consuls. 3. 'De Præfecto Urbis feriarum Latinarum caussa;' this was also a temporary magistrate appointed while the consuls were attending the Latin festivals on the Alban Mount. [ALBA LONGA.] 4. 'De ultimo Præfecto sub Imperatoribus creato.' Augustus created the permanent office of præfect of Rome, which was filled by a senator appointed by the emperor, sometimes for life, sometimes for a shorter period. Messala Corvinus was the the first præfect appointed, but he soon after resigned, and Mæcenas succeeded him. Panvinius, in his 'Annals,' has given a list of all the præfects of Rome from Augustus to the fall of the empire. In the following chapters Drakenborch explains the nature, importance, and various duties of the office. 5. 'De his qui ad Præfecturam Urbis admittuntur, eorumque dignitate.' 6. 'De Jurisdictione Præfecti Urbis.' 7. 'De Curâ Præfecti Urbis circa annonam.' 8. 'De Curâ Præfecti Urbis circa ædificia.' 9. 'Idem circa ludos.' 10. 'De variis Officiis ad Præfectum Urbis pertinentibus.' 11. 'De Insignibus Præfecti Urbis.' The præfect of Rome was the first civil magistrate of the city and country around as far as the hundredth milliary stone; he ranked next to the emperor, was supreme judge in all important causes, heard appeals from the inferior magistrates, had charge of the police of the city, the superintendence of the markets and provisions, and, what was no less important at Rome, of the public games. He had under his orders the 'milites urbanos et stationarios,' a sort of militia which kept guard in the city.

This valuable little work of Drakenborch has gone through several editions; that of Bareuth, 1787, contains an extract from the author's funeral oration, by Professor Oosterdyk, in which the other works of Drakenborch are mentioned. Upon leaving Utrecht he went to Leyden to study the law, but there also he devoted his chief attention to the classical lessons of Perizonius and Gronovius. He wrote, in 1707, another dissertation 'De Officio Præfectorum Prætorio,' in which he explains and illustrates the nature and duties of that important military office in the same manner as he had done for that of the præfects of the city. He states the changes made by various emperors and lastly by Constantine, who, having abolished the prætorians, appointed four præfects of the prætorium, one for each division of the empire, who were supreme magistrates within their respective jurisdictions.

Drakenborch undertook, by the advice of Peter Burmann, an edition of Silius Italicus, which appeared in 1717. On Burmann's removal to Leyden, Drakenborch succeeded him in the chair of eloquence and history at Utrecht. His edition of Livy, on which he bestowed much time and labour, was published in 1738-46, in 7 vols. 4to. The value of the edition lies in the large collection of various readings, and the illustration of idioms by parallel passages drawn from the writings of Livy. The text is decidedly inferior to that which is found in the unpretending editions by Stroth, Raschig, &c. He published also, 'De Utilitate et Fructu humanarum Disciplinarum Oratio inauguralis,' 'Oratio funebris in Mortem Francisci Burmanni,' and other orations and dissertations, and also a 'History of Utrecht,' and 'Genealogies of the noble Families of Holland.' He died at Utrecht in 1747.

DRAMA, ATTIC (δρᾶμα, an action), is said by Aristotle (*Poet.* iv., 14) to have arisen from the recitations of the leaders of the DITHYRAMBUS. To understand this statement we must bear in mind that a Greek tragedy always consisted of two distinct parts; the dialogue, which was written in the Attic dialect, and corresponded in its general features to the dramatical compositions of modern times, and the chorus, which to the last was more or less pervaded by Dorisms, and the whole tone of which was lyrical rather than dramatical. We must add that the metre of the dialogue, whether Iambic or Trochaic, was staid and uniform; while the choruses were written with every variety of metre. In a word, the dialogue was meant to be recited; the chorus was intended to be sung. It is obvious that these two elements must have had different origins. The one was an offshoot of the lyric poetry which sprung up among the Dorians, the other is to be referred to the rhapsodical recitations which were peculiar to the Ionian branch of the Greek nation; and as the Athenians stood in the middle between the Ionians and the Dorians, so the Attic drama may be considered as the point of intersection of the Ionian and Dorian literatures. That choral and consequently lyrical poetry should spring up among the Dorians was a natural result of the peculiar organization of a Doric state [DORIANS]; and the Epos as naturally arose among the Ionians, the countrymen of Homer. (*Hist. of the Literature of Greece*, in the *Library of Useful Knowledge*, p. 41 and following.) [HOMER.] The Ionian epic poetry, which was written in dactylic hexameters, was recited by a set of men called *rhapsodists* [RHAPSODY]; and the gnomic and didactic poetry of Hesiod was recited in the same way. But the dactylic hexameter was not found suitable for gnomic poetry, and a modification of it, consisting also of six feet, but each foot shorter by a half-time than the dactyl, was substituted for it. This metre (the Iambic), or a lengthened form of it (the Trochaic), was used by Archilochus, Simonides of Amorgos, and Solon, whose verses were recited by themselves or by rhapsodists in the same way as the epic poetry which preceded them.

The lyric poetry of the Dorians was originally appropriated to the worship of Apollo, but the particular odes and choruses used in this worship were in process of time transferred to the cognate deity, Bacchus (who was, like Apollo, the god of the sun [BACCHUS and DEMETER]; and these odes and choral dances had, all of them, their representatives in the dramatic poetry of a later age. (Athenæus, p. 630, D.) But the Dithyrambus was the earliest species of choral poetry connected with the worship of Bacchus, and it appears from many allusions, and indeed from Dithyrambic fragments, that while the body of the song was composed in irregular metres, the poet himself, or the rhapsodist, acting as exarchus, or leader, in his place, recited trochaics as an introduction. Here then was a mixture of recitation and chorus perfectly analogous to the tragedy of later time, which was probably suggested by it; and it is in this sense, we doubt not, that Aristotle's ascribes to the leaders of the Dithyrambus the origin of tragedy.

We read of a lyrical tragedy long before Thespis, and this appears to have been a modification of the Dithyrambus, with a lyrical accompaniment instead of the flute (αὐλός) to which it was originally danced, and with a substitution of men dressed as satyrs for the usual chorus, which alteration is attributed to Arion. The union of this lyrical tragedy with the recitations of rhapsodists is said to have been brought about by Thespis, a contemporary of Pisistratus and Solon, and may have been suggested as well by the recitations of the leaders of the Dithyrambus as by the union of rhapsodical recitations with Bacchic rites at the Brauronia. Thespis introduced one actor, an ὑποκριτής or respondent, who, standing on an elevated place, while the dithyrambic chorus were grouped around the altar of Bacchus, carried on a dialogue with them, or narrated some mythical story in character. The comedy of ancient Greece originated in the festival of the vintage, when the country people went from one village to another, in carts or on foot, holding aloft the phallus, or emblem of productiveness, and indulging in rude jests and coarse invectives. From these effusions comedy was developed either in Megaris or in Sicily. Its first approach to perfection was owing to the genius of Epicharmus, who is said by Plato (*Theaetet.* p. 152 E) to have borne the same relation to comedy that Homer did to tragedy. A similar comic drama sprang up about the same time at Athens, and was carried to a wonderful degree of strength and beauty.

The dramas of ancient Greece were always performed at and as a part of the festival of Bacchus [DIONYSIA]. The plays for exhibition had previously been submitted by their authors to a board of judges, and approved by them.

It would occupy too much space to give a complete catalogue of the very numerous works written on the Greek drama. A list of some of the principal of these will be seen at the end of the introduction to the fourth edition of the *Theatre of the Greeks* (Cambridge, 1836,) from which this account has been borrowed.

DRAMATIC ART AND LITERATURE. Of all the liberal arts, the dramatic (which, indeed, in its superior walks may be said to combine all the others) is that which is capable at once of the greatest comprehensiveness and of almost endless variety. This will distinctly appear from an attentive consideration of the several important elements essential to the producing of the highest class of theatrical exhibitions.

The first and simplest of the dramatic elements may be found existing in a high degree in works neither intended for the stage nor capable of being transferred to it—in simple dialogue. When, however, the persons of the colloquy deliver thoughts and sentiments which, though opposed to each other, operate no change, but leave the minds of both in exactly the same state in which they were at the commencement, the conversation may indeed be deserving of attention, but cannot be productive of any dramatic interest. To awaken the latter, the conversation must be animated by a different spirit. For instance, when, in Plato, Socrates asks the sophist, Hippias, what is the meaning of the beautiful, the latter promptly returns a superficial answer, but is afterwards compelled by the disguised attacks of Socrates to give up his former definition, and shift his ground again and again, until, ashamed and irritated at the superiority of the sage who has convicted him of his ignorance, he is at length reduced to quit the field. This dialogue is not only philosophically instructive, but arrests the attention like a little drama; and owing to this animation in the progress of the thoughts, and the solicitude with which we consequently look to the result, the dramatic character of the dialogues of Plato has always been justly admired.

From this we may conceive the great charm of dramatic poetry. 'Of all diversions,' observes the modern German critic, Schlegel, in his very able lectures on dramatic literature and art, 'the theatre is undoubtedly the most entertaining: we see important actions when we cannot act importantly ourselves: the highest object of human activity is man; and in the drama we see men, from motives of friendship or hostility, measure their powers with each other, influence each other as intellectual and moral beings, by their thoughts, sentiments, and passions, and decisively determine their reciprocal relations. The art of the poet is to separate from the fable whatever does not essentially belong to it: whatever, in the daily necessities of real life, and the petty occupations to which they give rise, interrupts the progress of important actions; and to concentrate within a narrow space a number of events calculated to fill the minds of the hearers with attention and expectation. In this manner it affords us a renovated picture of life—a compendium of whatever is animated and interesting in human existence.

'Nor is this all. Even in a lively verbal relation, it is frequently customary to introduce persons in conversation with each other, and to give a corresponding variety to the tone and the language. But the gaps which these conversations still leave in the story are filled up with a description of the accompanying circumstances, or other particulars, by the person who relates in his own name. The dramatic poet must renounce all such assistance; but for this he is richly recompensed in the following invention. He requires each of the characters in his action to be represented by a real person; that this person, in sex, age, and figure, should resemble as much as possible the ideas which we are to form of his imaginary being, and even assume every peculiarity by which that being is distinguished; that every speech should be delivered in a suitable tone of voice, and accompanied by corresponding looks and motions; and that those external circumstances should be added which are necessary to give the hearers a clear idea of what is going forward. Moreover, these representatives of the creatures of his imagination must appear in the costume suitable to their assumed rank, age, and country; partly that they may bear a greater resemblance to them, and partly because there is something characteristic even in the dresses. Lastly, he must see them surrounded by a place which in some degree resembles that where, according to his fable, the action took place; because this also contributes to the resemblance: he places them on a scene. All this brings us to the idea of the theatre. It is evident that in the form of dramatic poetry, that is, in the representation of an action by dialogue without any narration, the ingredient of a theatre is essentially necessary. We allow that there are dramatic works which were not originally destined by their authors for the stage, and which would not produce any great effect on it, that still afford great pleasure in the perusal. I am, however, very much inclined to doubt whether they would produce the same strong impression upon a person who had never seen a play, nor ever heard a description of one, which they do upon us. We are accustomed, in reading dramatic works, to supply the representation ourselves.'

A visible representation, then, being essential to the dramatic form, a dramatic work may be considered in a double point of view—how far it is poetical, and how far it is theatrical. In considering its poetical qualities it is not the versification and the ornaments of language that we have chiefly in contemplation, but the poetry in the spirit and plan of a piece; and this may exist in a high degree, when even it is written in prose. To be poetical in the higher sense, it must in the first place be a connected whole, and complete within itself. But this is merely the negative condition of the form of a work of art, by which it is distinguished from the phenomena of nature, which flow into one another, and do not possess an independent existence. To be poetical, it is necessary that it should be a mirror of ideas, of thoughts, and feelings, in their character necessary and eternally true, though moulded into an imaginative whole.

But how does a dramatic work become theatrical, or fitted to appear with advantage on the stage? The object proposed is, to produce an impression on an assembled crowd, to gain their attention, and excite in them an interest and participation. This part of his task is common to the poet with the orator. The latter attains his end by perspicuity, rapidity, and force. Whatever exceeds the ordinary measure of patience or comprehension, he must carefully avoid. Moreover, a number of men assembled together constitute an object of distraction to one another, if their eyes and ears are not directed to a common object beyond their own circle. Hence the dramatic poet, as well as the orator, must at the very outset produce an impression strong enough to draw his hearers from themselves, and so become master, as it were, of their bodily attention.

'The grand requisite in a drama,' remarks Schlegel, 'is to make the rhythmus visible in its progress. When this has once been effected, the poet may the sooner halt in his rapid career, and indulge his own inclinations. There are points where the most simple or artless tale, the inspired lyre, the most profound thoughts and remote allusions, the smartest coruscations of wit, and the most dazzling flights of a sportive or ethereal fancy, are all in their place, and where the willing audience, even those who cannot entirely comprehend them, follow the whole with a greedy ear, like a music in harmony with their feelings. The great art of the poet is, to avail himself of the effect of contrasts wherever he can,—to exhibit with equal clearness, at some times a quiet stillness, the musings of self-contemplation, and even the indolent resignation of exhausted nature, and at others the most tumultuous emotions, the raging storm of the passions. With respect to the theatrical, however, we must never forget that much must be suited to the capacities and inclinations of the audience, and consequently to the national character in general, and the particular degree of civilization. Dramatic poetry is in a certain sense the most worldly of all; for, from the stillness of an inspired mind it exhibits itself in the midst of the noise and tumult of social life. The dramatic poet, more than any other, is bound to court external favour for applause.'

It is important that we should enter into a preliminary consideration of the distinction which, we think, has been too rigorously drawn, in treating of dramatic composition, between the tragic and the comic species. Least of all the arts will the dramatic admit of that mechanical mode of critical analysis, to which indeed the spirit of all true art is essentially repugnant. We have already observed, that, even above all other artists, the dramatist, on whatever subject he employs his talent, is bound to seek, first of all, to please. Whether tragedy or comedy has attracted the spectator to the benches of the theatre, it is entertainment that he is come in quest of. The dramatist who cares to succeed in his art must therefore make it his primary object to furnish that entertainment. Let it not be supposed, as seems to have been mistakenly thought even by some critics of eminence, that any one goes voluntarily to witness a tragedy for the sake of painful excitement. Among the numerous and extremely miscellaneous audience collected in a great national theatre (which very diversity is not one of the least interesting circumstances incidental to our subject) there is, indeed, to be found, at one and the same moment, every grade of intellect, of feeling, and of taste; but even the rudest and most ignorant spectator, in the most animated scenes of the most admirably exhibited drama, never once thoroughly mistakes illusion for reality. Were he once to do so, the pleasing spell would be dissolved. It is not the presence of deep distress or convulsive passion that holds the theatrical auditor in pleasingly fascinated attention; it is the vivid picture of it. This grand mistake of regarding the audience as considering themselves present at an actual transaction has vitiated in several most important respects the judgment of some of the ablest writers on the principles of dramatic art. Most of the spectators, on the contrary, know very well what they go to see in the scenes of a play,—a series, closely and artfully connected, of living, moving, and speaking pictures,—but nothing more. Between the contemplation of actual suffering and that of the most lively representation of it, there is, as the art of the dramatist shows us yet more vividly than that of the painter, and the difference between deep pain and genuine though [illegible] pleasure. In the drama, as in painting, the most prosaic and literal imitation of nature, skilfully executed, whether the subject be mournful or cheerful, gives a [illegible] to the most ordinary observer; while a [illegible] imitation affords a more refined gratification to the [illegible], whether the scene be one of joyousness or [illegible]. The pleasure, indeed, which he will derive from a [illegible] art on a melancholy subject will bear a different [illegible] that afforded him by a mirthful or cheerful piece; but pleasure it will still be, and pleasure only. It is the [illegible] art that captivates him, and to which he yields in[illegible] homage. The different kinds of pleasure that [illegible] dramatic representations, according as their subjects [illegible] more or less of the cheerful or the melancholy [illegible] we shall shortly come to consider. Only we [illegible] it necessary to insist strongly in the first in[illegible] fallacy of the assumption that people [illegible] representation to receive impressions analogous [illegible] they experience in the contemplation of [illegible]

[illegible] of the dramatist, then, is to produce at [illegible] copy, but, if it be in his power, a poetical [illegible] of nature: this is the first condition of his giving pleasure. But as for the arbitrary distinction between tragedy and comedy, which criticism, whose birth is so long posterior to that of art, has established in so large a portion of civilised Europe, the more he has in him of the genuine artist the less will he feel inclined to conform rigidly to that critical demarcation. When we consider the infinitely chequered nature of human life and character, and consequently the boundless resources which it offers to the drama as its poetical mirror, we cannot but at once perceive that the images which that mirror is capable of presenting to us are susceptible of a diversity of features and of hues immensely exceeding the capabilities of any other single art—nay, of all of them combined. Now, among the boundless variety of pictures from human life, in all of which, embracing any considerable prospect, the serious and the mirthful must be mingled, it is plain that the proportions in which these two necessary elements exist in the same composition will admit of infinite gradation. In the nature of things, however, the portion of dramatic productions in which they may be taken to be equally balanced must be very small in comparison with that in which one of the two manifestly preponderates. This necessary preponderance, in the great majority of such works, of the mirthful or the serious element, is, it seems to us, the only sound and proper basis for the distinction between tragedy and comedy. The terms should be employed as convenient heads of classification, but as nothing more. Every work of art, in the higher sense of the word, is as much a work of inspiration as of ingenuity: it is a *growth* rather than a *structure;* and to reject a production of high dramatic genius because it should not fit into the conventional frame of tragedy, comedy, &c., so long the practice of one of the great dramatic schools of Europe, were no less absurd than it would be to exclude some newly-discovered plant from the domain of natural history because there should be no suitable place for it in the previously existing scientific nomenclature. This is a matter which we shall more clearly illustrate when we come, in another place, to speak of the dramatic genius of Shakspeare; but so much on general treatises on the drama has hitherto been written on the plan of making the principles of art subordinate to the distinctions of criticism, that it was impossible to take any satisfactory step in unfolding our view of the subject without explicitly protesting, in the first instance, against so vicious an inversion.

A complete history of the drama would be almost equivalent to a history of civilised society over the greater part of the earth. 'Man,' says Schlegel, 'has a great disposition to mimicry. When he enters vividly into the situation, sentiments, and passions of others, he even involuntarily puts on a resemblance to them in his gestures. Children are perpetually going out of themselves: it is one of their chief amusements to represent those grown people whom they have had an opportunity of observing, or whatever else comes in their way; and with the happy flexibility of their organization, they can exhibit all the characteristics of assumed dignity in a father, a schoolmaster, or a king. The sole step further which is requisite for the invention of a drama, namely, the separating and extracting the mimic elements and fragments from social life, has however in many nations never been taken. In the very minute description of antient Egypt, in Herodotus and other writers, I do not recollect observing the smallest trace of it. On the other hand, the Etrurians, who in many respects resembled the Egyptians, had their theatrical representations; and, what is singular enough, the Etrurian name for an actor, *histrio,* is preserved in living languages down to the present day. The Arabians and Persians, though possessing a rich poetical literature, are unacquainted with any species of drama.

'On the other hand, we are by no means entitled to assume that the invention of the drama has only once taken place in the world, or that it has always been borrowed by one people from another. The English navigators mention, that among the islanders of the South Seas, who in every mental acquirement are in such a low scale of civilization, they yet observed a rude drama, in which a common event in life was imitated for the sake of diversion. And to go to the other extreme—among the Hindoos, a people from whom, perhaps, all the cultivation of the human race has been derived, plays were known long before they could have experienced any foreign influence. It has lately been made known to Europe that they have a [illegible] dramatic literature, which ascends back for more than two thousand years. The only specimen of their plays (*nataks*) hitherto is the delightful *Sacontala*, which, notwithstanding the colouring of a foreign climate, bears, in its general structure, so striking a resemblance to our romantic drama that we might be inclined to suspect we owe this resemblance to the predilection for Shakspeare entertained by Jones (Sir William), the English translator, if his fidelity were not attested by other learned orientalists. In the golden times of India, the representation of this *natak* served to delight the splendid imperial court of Delhi; but it would appear that, from the misery of numberless oppressions, the dramatic art in that country is now entirely at an end. The Chinese, again, have their standing national drama, stationary perhaps in every sense of the word; and I doubt not that, in the establishment of arbitrary rules, and the delicate observance of insignificant points of decorum, they leave the most correct Europeans very far behind them. When the new European stage, in the fifteenth century, had its origin in the allegorical and spiritual pieces called *moralities* and *mysteries*, this origin was not owing to the influence of the antient dramatists, who did not come into circulation till some time afterwards: in those rude beginnings lay the germ of the *romantic* drama as a peculiar invention.'

In this summary we shall not enter into any further examination either of the antient or the existing oriental drama. Notwithstanding the great extent and fertility, the vast population and industry of those remoter Asiatic regions, the spirit of their social institutions, to whatever moral causes originally owing, seems to doom them (external influences apart) to a perpetual stationariness, excluding them as it were from the history of general civilization, which is essentially the history of progress. To the European races and nations it is plain that the destinies of human improvement, in all quarters of the earth, are chiefly committed; so that there is no impropriety, and little incompleteness, in confining our view to the nations of Europe, while taking a general survey of that important department of the belles-lettres and the fine arts which has held and must continue to hold so conspicuous a place among those things which, in the long stream of human history, have appeared successively as results and as causes of social amelioration.

We know that European civilization is now running at least its second course. We know that its former, and, as far as we have any historical indications, its first career began in Greece; and that in the small state of Athens especially, owing chiefly, it should seem, to the very high degree of civil freedom and equality which it acquired and long maintained, that early civilization, in all its nobler features, took a more vigorous and various development than it reached not only in any of the other Grecian states, but in the gigantic empire of Rome itself in its most polished days. The Roman drama in particular, for reasons which we shall indicate below, remained to the last little more than a faint imitation of the Athenian; so that it is not only primarily, but almost exclusively, the Grecian theatre, or, more strictly speaking, that of Athens, which we have to consider in treating generally of the antient drama.

Æschylus, the true father of the Attic drama (so far at least as we are acquainted with it,) was born in Attica about the year B.C. 525, and died probably about B.C. 456, having survived the splendid victories of Salamis, Platæa, and Mycale. Thus he may be said to have flourished during the vigorous youth of Athenian liberty and glory. He burned with all the ardour of a Grecian warrior of that day, when every citizen was a hero; and he commanded with distinction in the two most memorable actions of that illustrious period of his country's history, the battles of Marathon and Salamis. He just lived through the period in which both the democratic and the military spirit of Athens were excited to the highest pitch, and when consequently the heroic strains of Homer were in the highest favour among his countrymen, and would be recited with the most glowing enthusiasm. Conscious of such exalted poetical powers,—a witness and a sharer of such high patriotic achievement,—it is not surprising that the fiery genius of Æschylus should have inspired him to attempt to bring the powers of poetry to act upon his countrymen in some more vivid manner than lay within the province either of the lyric or the epic muse.

The substitution of dialogue and action in the place of mere recitation, the transition from the heroic narrative to the heroic drama, the making himself, in short, a dramatic Homer; such appears to have been the grand original conception, such the leading idea of Æschylus in his great literary invention. The highly-wrought poetical and martial enthusiasm of his countrymen sufficiently assured him of success in bringing his compositions before them; to effect which, like every man on the like occasion who with great inventive power combines great knowledge of actual life, he availed himself of such already existing medium as could with least violence be converted to his purpose. The festivals of Bacchus, as then celebrated, offered the fairest opening for his new experiment; he laid hold on the serious part of the celebration, the mixture of the dithyrambic chant with recitation, and modified that primitive species of tragedy into the heroic drama or regular tragedy, according to the subsequent acceptation of the term.

There are, however, three grand characteristics of tragedy as conceived by Æschylus, that distinguish it widely from the serious drama of modern times. These are, 1. The religious tone which pervades it throughout; 2. The ideal nature of the whole representation; 3. The large part in the composition still assigned to the lyric muse. These three matters we shall endeavour to place in a clear light before the reader, as upon a knowledge of them mainly depends the capability to form something like an accurate notion of the distinctive character of Grecian tragedy.

First, as regards the religious complexion of the Athenian drama. Modern readers, familiarised from their infancy with the names, attributes, and images of the antient deities, merely as presenting an inexhaustible storehouse of graceful poetic ornament, almost inevitably forget, in turning to peruse any original work of the antients, that, how much soever their philosophers, their poets, or their priests, might regard their principal divinities in a purely symbolical view, yet that to the minds of the people at large they were real and awful existences, having will, passions, and various kinds and degrees of dominion over the fortunes and the happiness of man. This important fact has not hitherto been sufficiently taken notice of in modern accounts of the antient drama. All the deities, male or female, celestial or infernal, were objects of fear and propitiation: only the inexorable Fates were unappeasable by god or man. Fate, indeed, was the only omnipotence recognised in the mythological system of the Greeks; for Jupiter himself, the ruler of the celestial deities, the sovereign of Olympus, was regarded neither as eternal nor as infinite in power. Nowhere have poetry and her sister arts been so thoroughly devoted to the service of religion as they were in antient Greece. Thus we find the drama itself lying in embryo in the worship of Bacchus; and when in its maturity it lost the direct character of a religious rite, we still find the sacred character impressed on tragedy even more solemnly than upon any of the other productions of Athenian genius not primarily devoted to religious objects. So long, indeed, as the personages of a long established faith (and here we speak solely with reference to the purposes of art), whether the gods and heroes of the heathen world, or the mysterious persons of the godhead, the angels, devils, and saints of the Christian system,—so long, we say, as these awful personages can furnish fresh materials to an epic or dramatic poet of powers equal to such a class of subjects, the grand and successful performances of a Dante, a Tasso, and a Milton, show us, not less strikingly than those of a Homer or an Æschylus, that these are the most attractive themes for the exercise of the loftiest poetic genius, and those which it handles with the most powerful effect.

The *ideality* of the scenic representation, as arranged by Æschylus, necessarily resulted from the adoption, in the composition of the drama, of ideal and of nearly ideal characters. 'The use of masks,' observes Schlegel, 'which appears astonishing to us, was not only justifiable on this principle, but absolutely essential; and far from considering them in the light of a last resource, the Greeks would justly have considered as a last resource the being obliged to allow a player with vulgar, ignoble, or strongly-marked individual features, to represent an Apollo or a Hercules. To them this would have appeared downright profanation. . . . As the features of the player acquired a more decided expression from the mask, as his voice was strengthened by a contrivance for that purpose, so also the *cothurnus*, which consisted of several considerable additions to his soles, as we may see in the antient statues of Melpomene, raised his figure considerably above the middle standard. The female parts, too, were played by men, as the voice and other qualities of women would have conveyed an inadequate idea of the energy of tragic heroines. The forms of the masks* and the whole appearance of the tragic figures, we may easily suppose, were sufficiently beautiful and dignified. We should do well to have the antient sculpture always present to our minds; and the most accurate conception, perhaps, that we can possibly have, is to imagine them so many statues in the grand style, endowed with life and motion. But as in sculpture they were fond of dispensing as much as possible with dress, for the sake of exhibiting the more essential beauty of the figure; on the stage they would endeavour, from an opposite principle, to clothe as much as they could well do, both from a regard to decency, and because the actual forms of the body would not correspond sufficiently with the beauty of the countenance. They would also exhibit their divinities, which in sculpture we always observe either entirely naked or only half covered, in a complete dress. They had recourse to a number of means for giving a suitable strength to the forms of the limbs, and thus restoring proportion to the increased height of the player.

'The great breadth of the theatre, in proportion to its depth, must have given to the grouping of the figures the simple and distinct order of the bas-relief. We moderns prefer on the stage, as everywhere else, groups of a more picturesque description, more crowded, partly covered by themselves, and stretching out into distance; but the antients were so little fond of foreshortening, that even in their painting they generally avoided it. The gestures accompanied the rhythmus of the declamation, and were intended to display the utmost beauty and harmony. The poetical conception required a certain degree of repose in the action, and that the whole should be kept in masses, so as to exhibit a succession of plastic attitudes; and it is not improbable that the actor remained for some time motionless in the same position. But we are not to suppose from this that the Greeks were contented with a cold and spiritless representation of the passions. How could we reconcile such a supposition with the fact that whole lines of their tragedies are frequently devoted to inarticulate exclamations of pain, to which we have nothing correspondent in any of our modern languages? It has often been conjectured that the delivery of their dialogue must have resembled the modern recitative. For this conjecture there is no other foundation than that the Greek, like almost all the southern languages, must have been pronounced with a greater musical inflexion of the voice than our languages of the north. In other respects I conceive that their tragic declamation must have been altogether unlike recitative, much more measured, and far removed from its learned and artificial modulation. The antient tragedy has also been frequently compared to the opera, because it was accompanied with music and dancing. But this betrays entire ignorance of the spirit of classical antiquity. Their dancing and music had nothing in common with ours but the name. In tragedy the chief object was the poetry, and every other thing was strictly subordinate to it; whereas in the opera the poetry is merely an accessary, the means of connecting the different parts together, and is almost buried under its associates.'

In the syllabic composition, which then at least prevailed in the Grecian music, the solemn choral song had no other instrumental accompaniment than a single flute, which could not impair the distinctness of the words. The choruses and lyrical songs in general form the portion most difficult to understand of the antient tragedy, and must also have been the most difficult to contemporary auditors. They abound with the most involved constructions, the most unusual expressions, and the boldest images and allusions. Such labour and art would hardly have been lavished upon them by the poets merely to be lost in the delivery. Such a display of ornament without aim is very unlike the mode of thinking of the Greeks. In the syllabic measure of their tragedy there generally prevails a highly-finished regularity, which, however, by no means appears a stiff symmetrical uniformity. Besides the infinite variety of the lyrical strophes, they have also a measure to denote the mental transition from the dialogue to the lyric, the anapæst; and two for the dialogue itself, of which the one by far the most general, the iambic trimeter, denoted the regular progress of the action, and the other, the trochaic tetrameter, was expressive of sudden passion. Indeed, the simplicity of the Greek tragedy, of which so much has been said, attaches only to the plan; for the richest variety of poetical ornament is observable in the execution. It must be remembered, too, that the utmost accuracy in the delivery of the different modes of versification was expected from the player, as the delicacy of the Grecian ear would not excuse, even in an orator, the false quantity of a single syllable.

'Modern critics,' says Schlegel, 'have never known what to make of the chorus.' This has arisen from the error by which criticism has been almost universally pervaded, viz., the viewing a production of art not in relation to the manners and the circumstances which surrounded its author, but to those existing around the critic himself. A very moderate degree of attention to the circumstances amidst which the Athenian drama took its birth is sufficient to remove everything like astonishment at the share which the lyrical element preserved in its composition. Among the most poetical people that has ever existed everything of the nature of a spectacle demanded the aid of song. The warlike march, the religious and the convivial procession, the nuptial ceremony, the feast and the funeral, would to them have been utterly spiritless and unmeaning without this accompaniment. The epic form, too, under which their greater and more national compositions present themselves to us in their earlier times, had, for a long period before the rise of the dramatic art among them, been rivalled by the lyric; and many old subjects of high heroic song had been embodied under a new shape in grand choral compositions, which, observes Mr. Thirlwall (*Hist. of Greece*, chap. xii.) 'uniting the attractions of music and action with those of a lofty poetry, formed the favourite entertainment of the Dorian cities. This appears to have been the germ out of which, by the introduction of a new element, the recitation of a performer who assumed a character, and perhaps from the first shifted his mask so as to exhibit the outlines of a simple story in a few scenes parted by the intervening song of the chorus, Thespis and his successors gradually unfolded the Attic tragedy.'

We must therefore dissent from the view taken by Schlegel himself of the origin and objects of the dramatic chorus of the Greeks. In considering this, as well as the other characteristics of the Grecian theatre, he has laboured under somewhat of the disability which we have mentioned above as attaching to the critics of latter ages in general. He has judged of the Athenian dramatists too exclusively from their remaining productions, without sufficient regard to all that existed immediately before and around them. Writings, we must recollect, were exceedingly scarce. It was by oral recitation that the greatest and most favourite productions of the epic and the lyric poets were chiefly circulated, and transmitted with more or less completeness in the memories of the multitude; so that, inasmuch as they were in all times intimately associated with vocal delivery and animated gesture, even the simply epic and lyric class had possessed among the Greeks much more of the vivid charms of dramatic recitation than is very readily conceivable by a modern to whom books are so easily and abundantly accessible. A modern poet writes, above all things, to be read; but the Grecian poet, even the epic poet, wrote, above all things, to be sung. In short, the union between music and poetry, among the Greeks more especially, down to the period which gave rise to the drama, was uniform and science, but with this important modification, that sound was ever kept subordinate to thought.

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* 'We have obtained a knowledge of these from the imitations in stone which have come down to us. They display both beauty and variety. That great variety must have taken place in the tragical department (in the comic we can have no doubt about the matter) is evident from the rich store of technical expressions in the Greek language for every gradation of the age and character of masks. (See the *Onomasticon* of Julius Pollux.) In the marble masks, however, we can neither see the thinness of the mass from which the real masks were executed, the still more delicate colouring, nor the exquisite mechanism of the joinings. The abundance of excellent workmen possessed by Athens in everything which had reference to the plastic arts will warrant the conjecture that they were in this respect inimitable. Those who have seen the masks of wax in the grand style, which in some degree contain the whole head, lately contrived at the Roman carnival, may form to themselves a pretty good idea of the theatrical masks of the antients. They imitate life even to its movements in a most masterly manner; and at such a distance as that from which the antient players were seen, the deception is most perfect. They always contain the apple of the eye, as we see it in the antient masks; and the person covered sees merely through the aperture left for the iris. The antients must have gone still farther, and contrived also an iris for the masks, according to the anecdote of the singer Thamyris, who, in a piece which was probably of Sophocles, made his appearance with a blue and a black eye. Even accidental circumstances were imitated; as, for instance, the cheeks of Tyro, down which the blood had rolled from the cruel treatment of his step-mother. Owing to the mask, the head must no doubt have appeared somewhat large for the rest of the figure; but this disproportion, in tragedy at least, would be obviated by the elevation of the cothurnus.'

Such being the firmly established practical circumstances of Greece, a transition all at once from the established epic and lyric forms to the purely dramatic was, we conceive, neither practicable even to a genius of the first order, as we admit Æschylus to have been, nor very likely even to enter into his imagination. Æschylus by no means introduced the chorus into the drama: he may be much rather said to have introduced the drama into the chorus; and that of itself was no slight achievement. We have already remarked that the idea of any great public exhibition unaccompanied by choral songs was one into which the Greek taste and imagination of that day could by no means enter. So strong however was the bent of Æschylus towards the dramatic that he not only retains the chorus as a lyrical accompaniment, but gives it also a participation in the action itself. This, in stamping the dramatic character upon the whole performance, was as far as he could venture to go, and, as we have already said, was most likely as far as he desired to go.

We must now, in order to complete the idea which we desire to present of the material forms of the Grecian drama, give a short account of the architectural structure and arrangements of the edifice itself in which the pieces were exhibited, when once, under the hand of Æschylus, their dramatic element was distinctly developed. Brief as we shall endeavour to make this description, some detail is indispensable, owing to the very different plan from the modern upon which the whole conception and design of the ancient drama required that its theatres should be constructed.

The theatres of the Greeks were open to the sky, and their dramas were always acted during the day, a mode of construction and of exhibition which was highly favoured by the beauty of their climate. As regards the inconvenience which many modern critics have supposed the poets to have felt, from the necessity of always laying the scene of their pieces before houses, and thus often violating probability, it should be observed that the Greeks lived much more in the open air than we do, and transacted many things in public places which with us usually take place in houses; and the stage did not represent a street, but a space before the house and belonging to it, whereon stood an altar on which the sacrifices to the household gods were offered up. Here the women, who among the Greeks lived in so retired a manner, might appear without impropriety, even the unmarried ones. Neither was it impracticable to give a view of the interior of the houses: this was done by means of the encyclema, which we shall presently describe.

The Grecian theatres, destined, not like those of the moderns, for a long succession of daily exhibitions, but for the celebration of a few annual festivals, were of that colossal magnitude which was indispensable to contain, as it were, the whole body of the people, together with the concourse of strangers who flocked to these solemnities. The distance to which the eyes of the spectators were thus necessarily thrown from the actual scene presents another obvious reason for and justification of the artificial expansion, as we may term it, of the whole figure of the actor. The groups on the stage, not to appear absolutely insignificant, needed, if possible, to be represented larger than life; and besides the fundamental reason which we have already stated for the constant use of the mask, that play of the actor's features which it concealed could not have been perceived with any distinctness across the vast space which separated him from the audience. Analogous to the use of the mask, the buskin, &c., were certain contrivances for increasing the loudness of the voice. Vitruvius tells us also of vehicles of sound distributed throughout the building, and though of these we have no very clear account, we may safely assume that the theatres of the ancients were constructed on very perfect acoustical principles. We know from express remarks that all who were present at the dramatic exhibition could be, in the literal sense of the word, spectators. The seats for them consisted of steps rising backwards round the semicircle of the orchestra, the name given to the whole internal area called in a modern theatre the pit. The lowest step of the amphitheatre was raised considerably above the orchestra; and opposite to it was the stage, placed at an equal elevation. The sunk semicircle of the orchestra contained no spectators, but served another purpose, which we shall shortly have to mention. The stage consisted of a strip, which, forming the chord of the semicircle, extended from one end of the building to the other, but the depth of which bore little proportion to this length. This was called the logeum, or, in Latin, pulpitum, and the usual place for the dramatic action was in the middle of it. Behind this middle part the scene receded quadrangularly; still, however, with less depth than breadth: the space thus comprised was called the proscenium. The remaining part of the logeum, to the right and left of the scene, had, both in front on the verge of the orchestra, and at the back, a wall entirely plain, or at most architecturally ornamented, which rose to the level of the uppermost seat for the spectators.

The decoration was so contrived that the principal object in front covered the back-ground, and the prospects of distance were given at each side; which is just the reverse of the mode adopted on the modern stage. This was done according to certain rules: on the left appeared the town to which the palace, temple, or whatever occupied the centre, belonged; on the right was the open country, landscape, mountains, sea-shore, &c. The lateral decorations were three-sided constructions turning on a pivot fixed underneath, by which means the changes of scene were partly effected. In the back decoration it is probable that many things were exhibited substantially which with us are only painted. When a palace or temple was represented, there appeared in the proscenium an altar, which answered a number of purposes in the course of the performance. The central decoration was most frequently architectural, though sometimes it was a painted landscape; and from a passage of Plato it seems clear that the Greeks must have carried theatrical perspective to very considerable perfection.

In the back wall of the scene were a large main entrance and two side ones; and as the hinder decoration was generally a palace in which the principal characters of royal descent resided, they naturally came through the great door, and the servants made their entrance from the wings. There were two other entrances; one at the end of the logeum, whence the inhabitants of the town came; the other in the orchestra below for characters who were supposed to come from a distance; they ascended the logeum by a staircase from the orchestra which was applicable to a variety of purposes, as circumstances required. The situation of these several entrances explains many passages in the ancient dramas, where the persons standing in the middle see some one advancing long before he comes near them. Beneath the seats of the spectators a stair was somewhere constructed through which the spectres of the departed, unperceived by the audience, ascended into the orchestra, and thence, by the staircase above mentioned, made their appearance on the stage. The nearest verge of the logeum sometimes represented the sea-shore. The Greeks were well skilled also in availing themselves, for scenic effect, even of what lay beyond the decorations: the frequent addresses to heaven were doubtless directed to the actual skies; and it was a general principle with them that everything imitated on the stage should, if possible, consist of actual representation; and only where this could not be done were they content with a symbolical exhibition. The machinery for the descent of gods to the earth or the withdrawing of men from it, was placed aloft behind the wall at each side of the scene, and so removed from the sight of the audience. There were hollow places beneath the stage, and contrivances for thunder and lightning, for the apparent fall or burning of a house, &c. An upper story could be added to the farthermost wall of the scene, when it was necessary to represent a tower having an extensive prospect, &c. The encyclema was a machine semicircular within, and covered above, which represented the objects contained in it as in a house: this could be thrust behind the great middle entrance; and we find it to have been so used for the production of a grand theatrical effect; the central entrance being then left open to exhibit the interior to the audience. A stage curtain is mentioned both by Greek and Roman writers; indeed its Latin appellation, aulæum, is borrowed from the Greeks: it seems, however, not to have been in use in the earlier period of the Attic theatre; and when brought into use, it covered, not the whole length of the logeum, but only the comparatively small front of the proscenium.

The entrances for the chorus were beneath, in the orchestra, in which it generally remained, and in which it performed its solemn dance, moving round first in one direction, then in the other, during the choral songs. In front of the orchestra, opposite to the middle of the scene, was an elevation with steps, resembling an altar, raised to the level of the stage, and called the thymele. This was the station of the chorus when it did not chant, but was taking an interest in the action. The leader of the chorus then took his or her station on the top of the thymele, to see what was passing on the stage, and to communicate with the characters. For though the choral song was common to the whole, yet when it entered into the dialogue, one of its number spoke for the rest, which accounts for the changing from the plural number to the singular, and *vice versâ*, in addressing them from the stage. The thymele was situated precisely in the centre of the building, and all the measurements were calculated from that point.

It is plain that the Grecian theatre, both in its architectural and its scenic arrangements, must have attained much higher perfection in the course of that illustrious period of Grecian art which we are accustomed to denominate, from its most characteristic and influential name, the age of Pericles, than it had reached at the termination of the dramatic career of Æschylus. The very building itself, which in the general and splendid restoration of Athens after the termination of the Persian war was reconstructed of massive stone, was originally of timber only. But as Æschylus was no less the creator of the theatre in all its essential parts than he was of the dramatic action itself, we have deemed this the fittest place in which to give some general notion of its structure and disposition.

Excepting only 'The Persians,' interesting rather as an historical than as a dramatic monument, the subject of each of the pieces of Æschylus that remain to us is either purely mythological, or taken from those traditions of the later heroic ages in which fable bears so large a part, or compounded from both those sources. In dealing with mythology (that is, as we have already requested the reader to bear steadfastly in mind, with the mystical personages immemorially fixed in the religious belief of his countrymen), Æschylus, like our own Milton, and, indeed, partly showing Milton the way, seems to have delighted to launch his imagination into that boundless and mysterious field which, according to the notions of antiquity, lay beyond and above the existence of even the greatest and the oldest of the Olympian deities. The dimness and vagueness of the prevailing ideas respecting those primæval powers of nature afforded the freest scope for the development of his most gigantic conceptions; and in that highest range of the mythological drama he found among the antients neither rival nor competitor. Above all, the opposition between inexorable fate and unconquerable will,—the only effectual shield, that of invincible fortitude, presented by a finite being against all that the awful and inevitable course of universal nature can inflict,—such appears to have been his favourite subject of contemplation. The sole mastery which he possessed in this sublime walk of tragedy demands that we should endeavour to present a more precise idea of his mode of applying such materials to the purposes of the drama. We shall therefore give a brief account of that one of his remaining pieces which most completely illustrates these peculiar powers of the great tragedian. This we shall do in the words of the eminent dramatic lecturer whom we have already repeatedly quoted; after first remarking that 'Prometheus Chained,' the tragedy in question, held a connected place between two others entitled 'Prometheus the Fire-bringer,' and 'Prometheus Loosed,' of both of which the Greek originals are lost, although a considerable fragment of the latter has come down to us in a Latin translation.

'The Chained Prometheus,' says Schlegel, 'is the representation of constancy under suffering, and that the never-ending suffering of a god. Exiled to a naked rock on the shore of the encircling ocean, this drama still embraces the world, the Olympus of the gods, and the earth of mortals, all scarcely yet reposing in a secure state above the dread abyss of the dark Titanian powers. The idea of a self-devoting divinity has been mysteriously inculcated in many religions, as a confused foreboding of the true: here however it appears in a most alarming contrast with the consolations of revelation. For Prometheus does not suffer on an understanding with the power by whom the world is governed; on the contrary, he atones for his disobedience, which disobedience consists in nothing other than an attempt to give perfection to the human race.... There is external action in this piece. Prometheus merely suffers, and resolves from the beginning to the end, and his sufferings and resolutions are always the same. But the poet has contrived in a masterly manner to introduce variety and progress into that which in itself was determinately fixed, and given us a scale for measuring the matchless power of his sublime Titans in the objects by which he has surrounded them. We have first the silence of Prometheus while he is chained down under the harsh inspection of Strength and Force, whose threats serve only to excite a useless compassion in Vulcan, who carries them into execution; then his solitary complaints; next, the arrival of the tender ocean nymphs, whose kind but disheartening sympathy induces him to give vent to his feelings, to relate the cause of his fall, and to reveal the future, though with prudent reserve he reveals it only in part; the visit of the antient Oceanus, a kindred god of the race of the Titans, who, under pretext of a zealous attachment to his cause, advises him to submission towards Jupiter, and is on that account dismissed with proud contempt; the introduction of the raving Io, driven about from place to place, a victim of the same tyranny from which Prometheus suffers; his prophecy of the wanderings to which she is still doomed, and the fate which at last awaits her, connected in some degree with his own, as from her blood he is to receive a deliverer after the lapse of many ages; the appearance of Mercury as the messenger of the tyrant of the world, who, with threats, commands him to disclose the secret by which Jupiter may remain on his throne secure from all the malice of fate; and lastly, the yawning of the earth before Prometheus has well declared his refusal, amid thunder and lightning, storm and earthquake, by which he himself, and the rock to which he is chained, are swallowed up in the abyss of the nether world. The triumph of subjection was never celebrated in more glorious strains; and we have difficulty in conceiving how the poet, in the 'Prometheus Loosed,' could sustain himself on such an elevation.'

This and all the other remains of Æschylus that we possess concur to testify that it was his usual practice to compose three tragedies in connection with each other, and of which the first and second, at their conclusion, manifestly referred to the one which was to follow. This must be carefully borne in mind in judging of any of the four single pieces that have come down to us, detached in each instance from the two other tragedies which originally combined with them to form a dramatic whole. Only one of these trilogies, as they were sometimes called, has descended to us complete; and from this alone it is that we can venture to judge as to the full extent of the powers of Æschylus in the general conception and arrangement of a great dramatic composition. Fortunately, we have every reason to regard this threefold tragedy as the most mature and perfect of all his productions: he was sixty-seven years of age when he brought these dramas on the stage, the last which he ever submitted in competition for the prize at Athens. These three pieces are, 1, 'Agamemnon;' 2, the 'Choëphoræ,' or Libation-bearers; 3, the 'Eumenides,' or Furies.

In this triple drama, or *Orestiad*, as it has sometimes been called, we have the noblest display of that fervent character of religion, poetry, and patriotism, which so strongly distinguished the earlier Grecian tragedy; while, considering it simply as a production of art, the sublime retrospect which in the first part is cast over the war of Troy, its occasion, and its catastrophe—the terrible chapters which are next unfolded to us of the domestic horrors entailed upon the house of Pelops—and the concluding glory which is cast around the tutelary goddess and guardian institutions of the poet's native country, furnish a series of scenes and of strains which, for severe grandeur, relieved by majestic beauty, have rarely been equalled—never, we believe, surpassed.

The historical relation in which Æschylus stood to Sophocles enabled the latter to avail himself of the inventions of the former. 'The more artful construction of the drama of Sophocles,' observes Schlegel, 'is easily perceived; the limitation of the chorus with respect to the dialogue, the polish of the rhythmus, and the pure Attic diction; the introduction of a greater number of characters; the increase of contrivance in the fable; the multiplication of incidents, a greater degree of development; the more tranquil continuance of all the movements of the action; the greater degree of theatrical effect given to incidents of a decisive nature; and the more perfect rounding of the whole, even considered in a merely external view..... To characterize the native sweetness and affection so eminent in this poet, the antients gave him the appellation of the Attic Bee. Whoever is thoroughly imbued with the feeling of this property may flatter himself that a sense for antient art has arisen within him; for the affected sentimentality of the present day, far from coinciding with him in this opinion, would, both in the representation of bodily sufferings and in the language and economy of the tragedies of Sophocles, find much of an insupportable austerity.'

It was indeed this thorough yet noble harmony of all his qualities, this dignified sweetness, that made Sophocles the favourite poet of the age of Pericles, to which we must observe, that the formation of the mind of Æschylus was just anterior. It was natural that the martial spirit of the warrior of Marathon should appear in his compositions with even more prominence than the calls of poetry strictly demanded; and thus it was remarked in his own age, in relation to one of his still existing pieces, the 'Seven Chiefs against Thebes,' that it was inspired by Mars rather than Bacchus. But with Sophocles the poetical vocation had predominated from the first, and occupied him during the whole of a lengthened and tranquil life. Grace, in the most refined sense of the term, is his grand distinction; but in boldness and comprehensiveness he was decidedly inferior to the mighty master who preceded him. The traditions respecting the Trojan war, and the tragic histories of the royal houses of Thebes and Mycenæ, furnished the principal themes to Sophocles, as they had done to Æschylus; and the 'Electra' of Sophocles, wherein he treated the same subject as Æschylus in the 'Choëphoræ,' fortunately remains to enable us to make a very exact comparison between the genius and style of the two poets.

We shall add but one concluding remark on these two great masters of the elder Grecian tragedy. The tendency of the genius of Æschylus in framing his great dramatic compositions was manifestly to embrace in the first instance a vast field of incident and invention, and reduce it to poetic order; while that of the mind of Sophocles was, to fix upon some given point of historic or mythologic interest, and, taking that as a nucleus, to expand it into poetic form. Æschylus was above all things a creator; Sophocles, a cultivator and adorner. The passion of the latter was more for the beautiful, that of the former for the sublime; but though Æschylus took the loftier and more adventurous flights, both moved in the elevated region of the ideal.

In characterizing the third great master of Grecian tragedy, we must take a course which we believe to be more conformable to reason, as well as more favourable to his genius than that adopted by many critics antient as well as modern, and among the latter by Schlegel himself. It is not fair, merely because Euripides necessarily treated these mythological subjects which were the common stock of the poets of his age, to force a strict parallel between himself and the tragic poets who preceded him. His mental training belonged to a later period of Athenian history and taste, and he possessed a genius essentially different from that of his predecessors, yet a genius assuredly great and rich. Sophocles, indeed, may justly be said to have belonged to the school of Æschylus; but Euripides was the founder of a dramatic school entirely new, and so was certainly more original than Sophocles, though moving, in one sense, in an inferior poetic sphere. That he not only did not pourtray mere men and women sufficiently according to the ideal standard, but that he drew down his demigods and his deities themselves to the level of human nature, seems to have been the gravest charge brought against Euripides in his own time by such as were attached exclusively to the ideal school of tragedy. But for these reproaches he was amply indemnified by the approbation and sympathy of the greater portion of the Athenian public. The great ideal representations to which they had previously been accustomed had, indeed, drawn abundantly on their admiration; but their sympathies had yet to be vividly and intimately stirred. This the habits and temper of Euripides inclined him to attempt, and this he successfully accomplished; nor need we wonder that, striking thus directly at the hearts of his auditory, he should have risen to share the public favour equally with Sophocles during the later part of the career of the latter, although, from the essential difference between their characteristic excellencies, there was no absolute competition between them. As nothing seems calculated to mark so distinctly the characteristic differences in the genius of great artists as an examination of their respective modes of treating one and the same subject; as the remarkable incident in the sanguinary annals of 'Pelops' line,' on which we have already had occasion to dwell, has been fated, as we shall see, to stand so prominently forward in the scrolls of modern as well as antient tragedy; and as the 'Electra' of Euripides remains to us among his extant pieces, we recommend it particularly to the attention of those readers who may find leisure for such examination, because, though far from being one of the finest of his remaining productions, it offers the best means of contrasting his dramatic character with the very different one of Sophocles.[*]

We shall, perhaps, form the best idea of the old Grecian comedy by considering it as a complete contrast to the ideal tragedy. Although the old comic writers gave the names of existing persons to their characters, they did not exhibit them on the stage with all the circumstances peculiar to certain individuals; for such historical characters have always with them an allegorical signification; they represent a class; and as their features were exaggerated in the masks, so their characters were overcharged in the composition. Still this constant allusion to the nearest reality, which not only allowed the poet, in the character of the chorus, to converse with the public in a general way, but also to point at certain individual spectators, is of essential import in any view of this species of composition. As the spirit of the elder tragedy delighted in harmonious unity, the old comedy, on the contrary, flourished in a chaotic exuberance, seeking out the most glaring and diversified objects, the most strongly marked oppositions, working up the most singular, unheard-of, and even impossible adventures, with the local peculiarities nearest at hand. The comic poet, indeed, as well as the tragic, transported his characters to an ideal element; not, however, to a world subjected to necessity, but to one where the caprice of an inventive wit prevails without restraint, and all the laws of reality are suspended.

Comedy, in the hands of its Doric founder Epicharmus, borrowed its materials chiefly from the mythical world. Nor in its maturity did it altogether relinquish that field, as appears from the titles of many of the lost pieces of Aristophanes and his contemporaries. But as a violent contrast between the materials and the form is here quite appropriate, the subjects of the old comedy were naturally drawn from the most serious concerns of public life and the state: the private and family life was only introduced occasionally, and indirectly, with a reference to the public. The chorus, besides that it was essential to the complete parody of the tragic form, also contributed to the expression of that festal gladness of which comedy was the most unrestrained effusion; for, as already observed, in all the popular and religious festivals of the Greeks, choral songs were chanted, accompanied by dancing. On some of these occasions we find in the comic chorus such a display of sublime lyrical poetry that the passages might be transferred to tragedy without alteration. It is, however, one deviation from the tragic model, that often there are several choruses in the same comedy, who at one time all sing together and in opposite positions, and at other times change with and succeed each other without any general reference. But the most remarkable peculiarity of the comic chorus is the *parabasis*, an address by the chorus to the spectators, in the name and under the authority of the poet, which has no immediate concern with the subject of the piece. Herein he sometimes enlarges on his own merits, and ridicules the pretensions of his rivals; at other times he avails himself of his privileges as an Athenian citizen, to deliver proposals of a serious or a ludicrous nature for the public good. The parabasis may have owed its invention partly to the circumstance of the comic poets not having such ample materials as the tragic to fill up the intervals of the action, when the stage was empty, with affecting and inspired poetry. But this very departure from the strictness of dramatic form is consistent with the essence of the old comedy; just as an individual, while wearing a droll disguise may, in the same spirit of drollery, venture occasionally to put aside the mask.

Of the Grecian comic writers of the old kind there is but one of whom any work has descended to us, so that in judging of his merits we can have no aid from comparison with other masters. Aristophanes had many predecessors,

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[*] For some remarks on the Satiric Drama, the reader is referred to the article Euripides.

Magnes, Cratinus, Crates, and others; he was indeed one of the latest comic authors of that school, as he survived even the old comedy itself. This writer, the very singularity of whose escape from the general wreck of the elder comic productions renders him so interesting and valuable to the history of dramatic art, has been very erroneously judged of in latter times, owing to two capital defects in the mode in which modern criticism has been applied to him, viz., the want of sufficiently understanding the spirit of Athenian society of that day in general, and yet more, the want of a just view of what constituted the essential character of the old comedy itself. It cannot be too repeatedly urged upon the attention of modern critics that an author must be judged with reference to all the circumstances, not which surround his modern censor, but which surrounded the author himself. It is much more reasonable to make use of the works of Aristophanes as a serious study of some remarkable features in the character of his age, than to cast them angrily aside, on the mistaken inference that because they contain much that is either disgusting or monstrous to modern taste, Aristophanes himself must have been a disgrace and a nuisance to any cultivated age.

This writer, too, is precisely one of those of whose qualifications and peculiarities it is most difficult to acquire an accurate notion without reading him in his original language. His diction is extremely elegant, displaying the purest Atticism, and accommodating itself with the greatest pliability to every tone, from the most familiar dialogue to the lofty elevation of the dithyrambic ode. His general elegance of language is found the more attractive from the contrast which he occasionally displays; for he not only indulges sometimes in the rudest popular expressions, in foreign dialects, and the mutilated articulation of the Greek in the mouths of barbarians, but extends the same arbitrary power which he exercised over nature and human affairs to language itself, and by new compounds, allusion to names of persons, or imitation of particular sounds, produces words of the most singular description.

'As Aristophanes,' says Schlegel, 'appears to me to have displayed, in the exercise of his separate but infinitely varied art, the richest development of almost every poetical property, whenever I read his works, I am equally astonished at the extraordinary qualifications which they suppose his spectators to have possessed. We might expect from the citizens of a popular government an intimate acquaintance with the history and constitution of their country, with public events and transactions, with the peculiarities of all their contemporaries of any note or consequence. But Aristophanes also supposes his audience to have possessed an extensive acquaintance with the mechanism of poetry; and, to understand his parodies, they must have had almost every word of the tragical masterpieces by heart. And how quick of apprehension they must have been to catch, in such rapid flight, the lightest and most complicated irony, the most unexpected sallies and unusual allusions, denoted often by the mere inflexion of a syllable! We may boldly affirm, that notwithstanding all the explanations that have come down to us, notwithstanding the accumulation of learning that has been displayed, one half of the wit of Aristophanes is altogether lost to the moderns. These comedies, which, amidst all their farcical peculiarities, display the most extensive knowledge of human life, could only, as a source of popular amusement, be properly understood and appreciated by the incredible acuteness and vivacity of the Attic intellect. We may envy the poet who could reckon on so clever and accomplished a public; yet this was in truth a very perilous advantage: auditors whose understandings were so quick would not be easily pleased. Aristophanes complains of the excessively fastidious taste of the Athenians, with whom the most admired of his predecessors were immediately out of favour when the smallest symptom of a falling off in their mental powers was perceivable. At the same time he allows that the other Greeks bore not the slightest comparison with them in a knowledge of the dramatic art. All the talents of Athens strove to excel in this department; and the competition was limited to the short period of a few festivals, during which the people always expected a succession of novelties. The distribution of the prizes (on which all depended, as there was aining notification of the public opinion) was y a single representation. We may easily at perfection this representation would attain ecting care of the poet. If we also take into consideration the high state of the tributary arts, the utmost distinctness of delivery of the most finished poetry, both in speaking and singing, with the magnificent extent of the theatre, we shall then have some idea of a theatrical enjoyment which has never in an equal degree been since known in the world.'

The old critics were of opinion that Cratinus was powerful in living satire and direct attack, but was deficient in a pleasant humour, in the talent of developing his subjects advantageously, and filling up his pieces with the necessary details; that Eupolis was agreeable in his jocularity, and skilful in the use of ingenious allusions and contrivances, so that he never even needed the aid of the parabasis to say whatever he chose, but that he wanted satirical force; that Aristophanes united the powers of both those writers, and that in him we have satire and pleasantry combined in the most perfect and attractive manner. But one of the most honourable testimonies in this dramatist's favour is that of no less an authority than the sage Plato himself, who, in an epigram, says that the Graces would have selected his mind for their dwelling-place, who constantly read him, and who transmitted his comedy of 'The Clouds' to Dionysius the Elder, with the remark that from that play (which, be it remembered, contains the imputedly murderous attack on Plato's master, Socrates) Dionysius would be able to acquaint himself with the state of Athens.

Towards the end of the Peloponnesian war, when a few individuals, violating the constitution, had assumed supreme authority in Athens, a law was enacted empowering any person attacked by comic poets to bring them to justice, and a prohibition was issued against introducing real persons on the stage, or using masks which bore a resemblance to their features, &c. This measure put a violent and final termination to the genuine old comedy. For a short time after, the endeavour was made to continue the existence of this ideal species under the political restrictions thus imposed: but these shackles were soon found to be fatal to its spirit and popular attractiveness; and this transitional kind, which has since been commonly designated as the middle comedy, soon gave way to the introduction of the new comedy, which, like the later Greek tragedy already mentioned, aimed at presenting a poetic mirror of actual life.

It has been almost universally the practice of modern writers on this subject to cite the testimony of Horace (*Ad Pisones*, vv. 281-284), as decisive evidence of the justice and necessity of this suppression of the political spirit of the elder Grecian comedy. But we must not forget that Horace, living easily and contentedly under a virtual despotism, erected too, like the very power which put down the old comedy, on the ruins of a republican constitution, could have little sympathy with that broadly democratic spirit which pervaded every public institution of Athens, and was little qualified to judge impartially respecting any one of its developments. The old comedy flourished during the existence of the Athenian liberty; both were oppressed under the same circumstances and by the same persons. It was under the very same violent usurpation of power that the sportive censure of Aristophanes was reduced to silence, and the grave animadversions of Socrates were punished with death. As for the alleged persecution of the latter by Aristophanes, besides that 'The Clouds' was composed many years before the philosopher's condemnation, we do not find that the like attacks did any harm to Euripides: the people of Athens beheld with admiration the tragedies of this friend of Socrates, and the parodies of them by Aristophanes, exhibited on the same stage. Nor can we too often repeat that notwithstanding the strong political tincture which, amidst a society like the Athenian, the unbounded license essential to the old comedy necessarily acquired, yet, from first to last, its primary aim was not so much effectiveness in satire as it was sublimity in the burlesque.

Although the new comedy developed itself only in the brief interval between the end of the Peloponnesian war and the first successors of Alexander the Great, yet the store of pieces in this kind amounted to some thousands: time, however, has made such ravage among them that nothing remains to us but a number of detached fragments in the original language, often so disfigured as to be unintelligible, besides about twenty translations or copies of Greek originals in Plautus and six in Terence. Among the Grecian masters, Diphilus, Philemon, Apollodorus, and Menander, are four of the most celebrated names. The palm for exgance, delicacy, and sweetness, is universally yielded to Menander, who was contemporary with Demetrius Phalereus. Though instructed in philosophy by Theophrastus, his inclinations led him to the doctrines of Epicurus; and he boasted in an epigram, that 'if Themistocles freed his country from slavery, Epicurus freed it from irrationality.' Indeed, the Epicurean philosophy, which placed the highest felicity of life in the benevolent affections, neither inciting men to heroic action nor allowing them to feel the want of it, could hardly fail to be well received among the Greeks after the loss of their old and glorious freedom. We may likewise easily understand why they conceived a passion for the new comedy at the very period when they lost their liberty, seeing that it drew their attention from political transactions and human affairs at large, and absorbed it wholly in the considerations of personal and domestic interests.

The Greek theatre, as we have seen, was originally constructed for the exhibition of the higher walks of the tragic drama: its stage was open to the sky, and exhibited but little of the interior of the houses. Comedy was therefore under the necessity of laying the scene out of doors; and had often to make people come out of their houses to confide their secrets to each other in the streets. It is true that the poets were thus spared the necessity of changing the scene, as it was taken for granted that the families concerned in the action lived in the same neighbourhood; besides that the Greeks, like all other southern nations, lived much more in the open air than we do. The chief disadvantage in this construction of the stage is, the circumscription of the female parts. If the actual manners were to be observed, as the essence of the new comedy required, the secluded life of the fair sex in Greece rendered the exclusion of unmarried women, and of young women in general, inevitable. No females could appear but aged mothers, maid-servants, or courtezans. Hence, besides the necessary sacrifice of so many agreeable situations, this other inconvenience is produced, that the whole piece frequently turns on a marriage with or a passion for a young woman whom the audience never once see from the beginning to the end of it.

Athens, where the fictitious as well as the actual scenes were generally placed, was the capital of a small territory, and inferior to our principal modern cities in extent and population. The republican equality admitted no marked distinction of ranks; all were alike citizens, richer or poorer. Hence the Attic comedy could admit but little of those contrasts arising from diversity of tone and cultivation which appear in those modern comedies wherein the manners of a court and the refinement or corruption of a monarchical capital are pourtrayed.

As regards the relations between the two sexes, the Greeks had nothing resembling either the gallantry of modern Europe, or the union of love with enthusiastic and respectful admiration. All ended in sensual passion or in marriage. The latter, by their constitution and manners, was a matter much more of duty or convenience than of inclination. The society of a wife, who frequently had not been once seen before marriage, and had passed all her previous life within the walls of a house, proving no great source of entertainment, the latter was sought among women entitled to less ceremony, and who were generally either foreigners without property or emancipated slaves. The indulgent morality of the Greeks permitted almost every degree of freedom with women of this description, especially in the case of young and unmarried men; and consequently the old comic writers exhibit this kind of life very undisguisedly. Their comedies often end with a marriage—a catastrophe which, according to Schlegel, 'seems to bring seriousness along with it;' but with them marriage is frequently nothing more than a means of reconciliation with a father for the irregularities of a forbidden amour: sometimes, however, it happens that the amour is turned into a lawful marriage by a discovery that the woman, supposed to be a foreigner or slave was by birth an Athenian citizen. From all the circumstances we have stated, it will appear little surprising that the poets of the later Grecian comedy had so small a circle of characters at their disposal: we enumerate the principal in the words of Schlegel:—'The austere and frugal or the mild and yielding father, the latter not unfrequently under the dominion of his wife, and making common cause with his son; the housewife either loving and sensible, or obstinate, domineering, and proud of the dowry brought by her to the family property; the young man giddy and extravagant, but open and amiable, who, even in a passion, sensual at its commencement, is yet capable of true attachment;—the vivacious girl, who is either thoroughly depraved, vain, cunning, and selfish, or still well disposed, and susceptible of higher emotions;—the simple and boorish slave, or the cunning one, who helps his young master to deceive his old father, and obtain money by all manner of devices, for the gratification of his passions;—the flatterer or accommodating parasite, who, for the sake of a good meal, is ready to say or do anything that may be required of him;—the sycophant, whose business it was to set quietly disposed people by the ears and stir up law-suits, in conducting which he offered his services;—the braggart soldier returned from foreign service, generally cowardly and simple, but assuming airs from the fame of his foreign achievements;—a female servant or pretended mother, who preaches a bad system of morals to the girl entrusted to her guidance;—and lastly, a slave-dealer, who speculates on the extravagant passions of young men.' The running servant is usually also the buffoon, who confesses his own sensuality and want of principle with a kind of self-complacent exaggeration, jests at the expense of the other characters, and even occasionally addresses the audience. We must not, however, forget that the Greek servant was a slave exposed for life to the arbitrary caprice of his master, and often subjected to the severest treatment; so that cunning was his natural weapon of defence, and artifice his habitual practice.

It is remarkable that while in other respects the new comedy approached so much nearer to real life than the old, yet the masks in the former deviated farther from reality than in the latter, were more overcharged in the features, and bore a greater resemblance to caricature. It would seem that, as the dramatists were now forbidden to exhibit portraits of real persons on the stage, they were always in fear of stumbling accidentally upon some such resemblance, especially to any of their Macedonian rulers, and so endeavoured in this way to obviate all such danger. Yet the exaggeration in question would hardly be without its peculiar meaning; and accordingly we find it stated that an unequal profile, with one eyebrow drawn up and the other down, was expressive of useless and meddling activity; as, indeed, it is observable that persons accustomed to look at things with anxious minuteness are apt to acquire such distortions.

Though confined in their choice of subject to the narrow range of their civil and domestic life, the inventive genius of the Greek comic writers contrived to exhibit a wonderful variety in their productions: yet in the selection and arrangement of their incidents they were ever true to their national manners and circumstances. As Greece consisted of a number of small separate states lying near and round one another, on sea-coasts and islands, navigation was general, piracy frequent, and human beings were thus procured for the supply of the slave trade. Freeborn children were liable either to be carried off from their parents, or to be exposed by them, by virtue of the legal right which they possessed, and in some cases would be unexpectedly saved from perishing or delivered from captivity, and so recovered by their parents: here we see the groundwork of the numerous recognitions between parents and children, brothers and sisters, &c., which appear in the later Grecian comedy.

The writers in this walk employed themselves, too, on all the subordinate departments,—the farce, the piece of intrigue, the various gradations of pieces of character, from caricature up to the most refined species, and even the serious or sentimental drama. We find also, from the titles of the pieces, and other circumstances, that they sometimes introduced historical persons, as the poetess Sappho for instance, representing the love of Alcæus and Anacreon for her, and hers for Phaon; and we may well suppose that this occasional mixture of beautiful passion with the tranquil grace of the ordinary comedy was exceedingly attractive.

The Romans, whose drama immediately follows that of the Greeks, were not led to the invention of theatrical amusements from the want of representations to fill up the leisure of their festivals, and enliven the mind by withdrawing it from the concerns of life; but, in the despondency of a desolating pestilence, against which all remedies seemed insufficient (year of Rome, 391), they had, according to the story, recourse to the theatre as a means of appeasing the anger of the gods, having previously been acquainted only with gymnastic exercises and circus races. The *histriones*, for whom they sent to Etruria, were however merely dancers, who probably did not attempt pantomimic movements, but strove to delight their audience by a display of bodily activity. The oldest spoken plays, the 'Fabulæ Atellanæ,' were borrowed by the Romans from the Osci, the indigenous inhabitants of Italy. [ATELLANÆ.] They were satisfied with these amusements till Livius Andronicus, somewhat more than five hundred years after the foundation of Rome, began the imitation of the Greeks; and the regular compositions of tragedy and the new comedy (the old it was impossible to transplant) were then, for the first time, known in Rome. Thus the Romans owed the first idea of a play to the Etrurians, the effusions of a sportive humour to the Oscans, and the higher class of dramatic productions to the Greeks. They displayed, however, more originality in the comic than in the tragic department.

The Romans had, besides, their peculiar *mimi*. Their foreign name for these small pieces might lead us to conclude that they bore a great affinity to the Greek mimi: however, they differed considerably in form: we know also that the manners pourtrayed in them had a local truth, and that the subject was not derived from Grecian compositions. The later Greek mimi were dialogues in prose, yet written with a kind of rhythm, not designed for the stage; the Roman were in verse, were represented, and often delivered extempore. Their most celebrated authors in this way were contemporary with Julius Cæsar. These were, Laberius, a Roman knight, and P. Syrus, his freedman and scholar in the mimetic art. Not one of these compositions has descended to us entire. We have, however, a number of sentences from the mimi of Syrus, which, from their internal worth and elegant conciseness of expression, deserve to rank with those of Menander. One entire mimus, which unfortunately time has not spared for us, would have thrown more light upon the question than all the confused accounts of the grammarians, and all the conjectures of modern scholars.

The regular comedy of the Romans was for the most part *palliata*, that is, it appeared in a Grecian dress, and represented Grecian manners. This is the case with the whole of the comedies of Plautus and Terence. But they had also a *comœdia togata*, so called from the Roman dress which was worn in it. Afranius is celebrated as the principal writer in this department. We have no remains whatever of him; and the accounts of the nature of his works are so very scanty, that we cannot even determine, with certainty, whether the togatæ were original comedies of an entirely new invention, or merely Greek comedies adapted to Roman manners. The latter supposition is the more probable, as Afranius lived in a period when the Roman genius had not yet attempted to soar on the wings of original invention; and yet we cannot well conceive the possibility of adapting Attic comedies, without the most violent constraint, to local circumstances of so very different a nature. The Roman way of living was in general serious and grave, though in private society they showed a great turn for wit and joviality. The diversity of ranks among them was politically marked in a very decided manner, and the wealth of private individuals was frequently not inferior to that of sovereigns: women lived much more in society, and acted a much more important part than among the Greeks, through which independence they fully participated in the overwhelming tide of corruption, and the external refinement by which it was accompanied. With these essential differences in the social system, an original Roman comedy would have been a most interesting phenomenon, and would have enabled us to view those conquerors of the world under an aspect altogether new. That this however was not accomplished in the *comœdia togata*, the indifferent manner in which it is mentioned by the antients will hardly leave us room to doubt. Quintilian himself tells us in plain terms that the Latin literature was lamest in comedy.

It remains to say a few words of Terence and Plautus, of whom alone, among the Roman comic writers, we have any perfect remains. Among the Greeks, the poets and artists lived at all times in the most honourable social relations. Among the Romans, on the contrary, polite literature was at first cultivated by men of the lowest class, by indigent foreigners, and even by slaves. Plautus and Terence themselves, who lived about the same period, towards the end of the second Punic war, and in the interval between the second and third, were of the lowest rank; the former a poor day-labourer, the latter a Carthaginian slave, and afterwards a freedman. Their fortunes and associations however were very different. Plautus, when he was not composing comedies, was under the necessity of working at a hand-mill for subsistence; while Terence was admitted into familiar intimacy with the elder Scipio and his bosom friend Lælius. The different habits of life of the two dramatists distinctly appear in their respective modes of writing; the bold roughness of Plautus, and the coarse originality of his jests, betray his intercourse with the lower orders; while in Terence we discern the tone of good society. Plautus inclines to the exaggeratedly droll and farcical; Terence prefers the delicately characteristic, and approaches the seriously instructive and the sentimental. Some of the pieces of Plautus are taken from the Greek comic writers Diphilus and Philemon, whom we have already had occasion to mention among those of whose works only fragments remain: there is little doubt however that he added much of his native coarseness to his originals. From whom he derived the other does not appear; except, as Schlegel remarks, we may consider ourselves warranted by the assertion of Horace, 'It is said that Plautus took for his model the Sicilian Epicharmus,' in conjecturing that he borrowed his 'Amphitryo,' a piece of quite a different kind from the others, and which he himself calls a tragi-comedy, from that old Doric writer, who employed himself chiefly on mythological subjects. Among the plays of Terence, whose copies from the Greek are probably much more faithful in details than those of Plautus, we find two taken from Apollodorus, and the rest from Menander. Julius Cæsar bestowed some verses of his own composition upon Terence, wherein he pays him the rather equivocal compliment of calling him a half Menander; praising the elegance of his style, and only regretting that he falls short of the comic strength of his original.

With respect to tragedy, it must first of all be observed that the Grecian theatre was not introduced into Rome without considerable changes in its arrangement; that the chorus no longer had a place in the orchestra (wherein the most distinguished spectators, the senators and knights, now sat), but remained on the stage itself. At the very introduction, too, of the regular drama, Livius Andronicus, a Grecian by birth, and the earliest tragic poet and actor of Rome, in the monodies (lyrical pieces chanted by a single person, and not by the chorus), separated the singing from the mimetic dancing, so that the latter alone remained to the actor; and instead of the former, a boy stood beside the flute-player, and accompanied him with his voice. Among the Greeks in better times, the tragic singing and the accompanying rhythmical gestures were so simple, that one person was sufficient to do at the same time the most ample justice to both. The Romans, however, it would seem, preferred separate skill to harmonious unity. Hence arose their fondness, at an after period, for pantomimes, of which the art was, in the time of Augustus, carried to the greatest perfection. From the names of the most celebrated of the performers, Pylades, Bathyllus, &c., it would appear that those who practised this mute eloquence in Rome were Greeks; and the lyrical pieces which the dancing expressed were also delivered in the Grecian language. Roscius frequently played without a mask, and in this respect probably did not stand alone; but so far as we know, there never was any such instance among the Greeks.

In the tragic literature of the Romans there are two epochs: the first is that of Livius Andronicus, Nævius, Ennius, and also of Pacuvius and Attius, who both flourished somewhat later than Plautus and Terence; and the second, the refined epoch of the Augustan age. The former produced only translators and imitators of Greek models; but it is probable that they succeeded better in tragedy than in comedy. Elevated expression usually appears rather stiff in a language not sufficiently cultivated, although it is attainable by perseverance; but to catch the negligent grace of social raillery, we must ourselves be possessed of humour and refinement. Here, however, as in the case of Plautus and Terence, we have not a single fragment of the Greek originals to enable us to judge of the accuracy and general felicity of the copies; but a specimen of considerable length of the 'Freed Prometheus' of Attius is hardly unworthy of Æschylus, and is also, in versification, much more polished than the productions of the Latin comic writers generally are. This earlier style was carried to perfection by Pacuvius and Attius, whose pieces kept their place on the stage, and seem to have had many admirers down to the time of Cicero, and even later.

The contemporaries of Augustus were ambitious of measuring their powers with the Greeks in a more original way. The number of amateurs who attempted to shine in tragic composition was particularly great; and we find mention made even of works of the emperor himself. Hence there is strong reason for supposing that Horace wrote his epistle to the Pisos chiefly with a view to deter those young men from so dangerous a career, as they were probably infected by the prevalent literary passion without possessing the requisite talents. One of the most renowned tragic poets of that age was Asinius Pollio, a man of impassioned disposition, as Pliny informs us, and who, in plastic works, was fond of whatever bore the same character. It was he who brought with him from Rhodes the well-known group of the Farnesian Bull, and erected it at Rome. 'If,' observes Schlegel, 'his tragedies bore the same relation to those of Sophocles which this bold, wild, and rather extravagant group does to the tranquil grandeur of the Niobe, we have every reason to regret their loss.' But the political importance of Pollio might easily bias the judgment of his contemporaries as to the value of his poetical labours. Ovid, who tried so many departments of poetry, likewise attempted tragedy, and was the author of a 'Medea;' and Quintilian asserts that he proved here, for once, what he could have done had he chosen to restrain himself, instead of yielding to his natural propensity to diffuseness.

These and all the other tragic attempts of the Augustan age have perished. Yet, according to all appearances, the loss to the interests of dramatic art is not very great. The Grecian tragedy had at first to struggle in Rome with all the inconveniences of a plant removed to a foreign soil: the Roman religion was in some degree related to the Greek, though by no means so completely the same as many have supposed; but the heroic mythology of the Greeks was merely introduced into Rome by the poets, and was in nowise connected with the national recollections. And 'although,' as Schlegel remarks, 'the Romans were at length desirous of becoming thorough Hellenists, they were deficient in that milder humanity of which we may observe traces in Grecian history, poetry, and art, even in the time of Homer. From the most austere virtue, which, like Curtius, sacrificed every personal inclination to love of country, they proceeded, with the most fearful rapidity, to a state of corruption, from avarice and luxury, equally unexampled. In their character they always betrayed that their first founder was not suckled at the breast of a woman, but of a raging wolf. They were the tragedians of the world's history, who exhibited many a deep tragedy of kings led in chains and pining in dungeons; they were the iron necessity of other nations—universal destroyers, for the sake of rearing at last, from the ruins, the mausoleum of their own dignity and freedom in the midst of an obsequious world reduced to one dull uniformity. It was not given to them to excite emotion by the mitigated accents of mental suffering, and to touch with a delicate hand every note of the scale of feeling. They naturally sought also in tragedy, by overleaping all intervening gradations, to reach at once the extreme, both in the stoicism of heroism, and in the monstrous fury of criminal desires. Nothing of their antient greatness had remained to them but their contempt of pain and death, when, after an extravagant enjoyment of life, they were at length called upon to submit to those evils. They then impressed this seal of their former grandeur upon their tragic heroes, with a self-satisfied and ostentatious profusion.

'Finally, in the age of polished literature, among a people fond, even to a degree of madness, of shows and spectacles, the dramatic poets were still in want of a poetical public. In the triumphal processions, the fights of gladiators and of wild beasts, all the splendours of the world, all the wonders of every clime, were brought before the eye of the spectator, who was glutted with scenes of the most violent and sanguinary description. What effect could the more refined gradations of tragic pathos produce on nerves so steeled? It was the ambition of the powerful among them to exhibit in one day to the people, on stages erected for the purpose, and immediately afterwards destroyed, the immense plunder which they derived from foreign or civil war. The relation which Pliny gives of the architectural decoration of the stage erected by Scaurus borders on the incredible. When magnificence could be carried no farther, they endeavoured to surprise by the novelty of mechanical inventions. In this way, one Roman, at the burial solemnity of his father, caused two theatres to be constructed in honour of him, with their backs resting on each other, and made to move in such a manner on a single hinge, that at the end of the play they were wheeled round with all the spectators within them, and formed together into one circus, in which gladiatorial combats were exhibited. In the gratification of the eyes that of the ears was altogether lost; rope-dancers and white elephants were preferred to every dramatic entertainment; the embroidered purple robes of the actor were applauded, as Horace informs us; and so little attentive and quiet were the great body of the spectators, that he likens their noise to that of the roaring of the ocean, or of a mountain forest in a storm.'

From the sole specimen of the tragic talent of the Romans that remains to us it would, however, be unfair to draw a conclusion as to the productions of better times: we allude to the ten tragedies which go under the name of Seneca. Respecting their real authorship the opinions of the learned are very much divided; some attribute them partly to Seneca the philosopher, and partly to his father the rhetorician; others ascribe them to one Seneca a tragedian, a different person from either. It is generally admitted that the several pieces are neither from the same hand, nor even of the same age. We might be induced to consider them as productions of a very late period; but Quintilian quotes a verse from the 'Medea' of Seneca, which is to be found in the play of that name in the collection in question, and hence the authority of this piece cannot be doubted, though in merit it does not seem in any way pre-eminent above the others. The state of violence and constraint in which Rome was kept under a series of sanguinary tyrants had also given an unnatural character to eloquence and poetry. Under the wise and mild government of a Vespasian, a Titus, and more especially a Trajan, the Romans returned to a purer taste. But whatever period may have given birth to these tragedies of Seneca they have been severely, perhaps, yet not unjustly, characterized as bombastical and frigid, unnatural in character and action, revolting from their violation of every propriety, and so devoid of theatrical effect as to induce a belief that they were never intended to leave the rhetorical schools for the stage.

With pagan Rome fell antient art. Nevertheless there are one or two links of connection between the antient drama and that of the middle ages, which modern writers have not always observed. There are even still existing some fragments of a play in Greek Iambics on a Jewish Scripture subject, taken from the Exodus or departure of the Israelites from Egypt. The principal characters are, 'Moses, Sapphora, and God from the bush,' that is, God speaking from the burning bush. Moses delivers the prologue in a speech of 60 lines, and his rod is turned into a serpent on the stage. The author of this piece, a Jew named Ezekiel, is supposed by Warton, the historian of English poetry, to have written it after the destruction of Jerusalem, to inspire his dispersed and captive brethren with hopes of deliverance under a new Moses, and to have composed it in imitation of the Greek drama, at the close of the second century. (See the edition and German translation of L. M. Philipson, Berlin, 1830, 8vo.)

It appears that in the first ages of Christianity any one connected with the theatre was not allowed baptism. Among 'the fathers,' Cyril declares that when in our baptism we say 'I renounce thee, Satan, and all thy works and pomps,' those pomps of the devil are stage-plays and the like vanities. Tertullian, in like manner, affirms that they who in baptism renounce the devil and his pomps cannot go to a stage-play without turning apostates. Cyprian, Basil, and Clement of Alexandria are no less vehement on the same point; and Chrysostom exclaims loudly against such as could listen to a comedian with the same ears with which they heard an evangelical preacher. Augustine maintains that those who go to plays are as bad as they who write or act them. Tertullian, in his warmth against the buskined actors in particular, observes, with peculiar emphasis, that 'the devil sets them upon their high pantofles to give Christ the lie, who said nobody can add one cubit to his stature.' Rymer, in his 'Short View of Tragedy,' adds, that these flashes and drops of heat, from single authors, had no such wonderful effect, for that the tragedian still walked upon his high shoes. 'Yet,' says he, 'might they well expect a more terrible storm from the reverend fathers when met in a body together, in council œcumenical. Then indeed began the ecclesiastical thunder to fly about; and presently the theatres, tragedy, comedy, bear-baiting, gladiators, and heretics, are given all to the devil without distinction.' But when the blind zeal of the fathers against all heathen literature had been ironically seconded by the emperor Julian with an edict forbidding any Christian to be taught in the heathen schools or to make use of that learning, two ecclesiastics of that time, of considerable learning, undertook to supply in some degree the deficiency of instruction and entertainment experienced by their Christian brethren from the operation of Julian's law. These were Apollinarius, bishop of Laodicea, and his father, a priest of the same city. [Apollinarius.] The latter not only, in treating Scriptural subjects, imitated on a large scale the great epic and lyric poets of Greece, but also turned various historical passages of the Old and New Testament into comedies and tragedies after the Greek model. About the same time the celebrated Gregory Nazianzenus, patriarch and archbishop of Constantinople, composed plays from the Old and New Testament, which, converting the choruses into Christian hymns, he substituted for those of Sophocles and Euripides at Constantinople, where until then the old Grecian stage had continued to flourish. One only of Gregory's plays (or at least a play attributed to him) is extant, a tragedy, entitled 'Christ's Passion:' the prologue calls it an imitation of Euripides (it being, in fact, made up of scraps of that author), and at the same time acquaints us that in this piece the patriarch has the honour of introducing the Virgin Mary's first appearance on the stage. It is not known whether the religious dramas of the Apollinarii perished so early as some of their other writings, which were ordered to be destroyed for the very common offence of heresy; but certain it is that the species of literary culture which they endeavoured to supply gradually disappeared before the progress of Constantine's establishment.

In the general extinction of polite literature and liberal art, which darkened for so many centuries the moral face of Europe, every trace of truly dramatic performance or composition seems to have disappeared. The Saturnalian pageants—the Feast of Fools, the Feast of the Ass, &c.,—exhibited during that long interval, chiefly at the Christmas and New Year festivities, claim notice here, not as bearing much affinity to, but merely as in some degree filling up the place of, the old theatrical portion of the religious celebrations. To arrive once more at any indication of the general existence of what can with propriety be called a religious *drama*, we must descend to a later period of European history. And as in each of the great nations of modern Europe this religious drama gave way but gradually before that rise of the modern stage which accompanied the revival of letters, and has even, in one of those nations, strongly maintained its ground until very recent times, so as to become permanently incorporated, as it were, with the national theatre, we can most conveniently and effectively give such more particular notice of it in each nation as we have to present to our readers, in combination with the rapid view which we have to take of the rise and progress of the modern stage in each of the five great literary countries of Europe, viz., in Italy, Spain, France, Germany, and England. The theatre of each of these countries we shall consider, in the order of succession in which we have here enumerated them, but for the sake of convenience we have arranged the whole under English Drama.

If there really survived, throughout the darkest period of the middle ages, in the form of successive imitations, any traces of the Christianized Greek drama of the primitive church, they seem to have been preserved, where perhaps we should most naturally look for them, among the Italians. Dr. Burney, in his researches into the history of music, ascertained that a spiritual play was performed at Padua as early as the year 1243; and in 1264 a company or fraternity was instituted at Rome, whose chief business was to represent, in the Passion week, the sufferings of Christ, and whose statutes were printed at that city in 1654. In 1298 the Passion was acted at Friuli, and the same year, at Whitsuntide, of Civita Vecchia performed the play of Christ, his passion, resurrection, ascension, judgment, and of the Holy Ghost: in 1304 they acted the of Adam and Eve, the annunciation, the birth of The late Rev. Mr. Croft and the Hon. Topham Beauclerk collected a great number of Italian mysteries; and at the sale of their libraries, Dr. Burney purchased many of the most antient, which he speaks of as being evidently much earlier than the invention of printing, from the gross manner in which the subjects are treated, the coarseness of the dialogue, and the ridiculous situations into which the most sacred things and persons are thrown.

DRAMMEN, a seaport town of Norway, situated on both sides of the broad and impetuous river of the same name, which here discharges its waters into the Drammen-fiord, in the gulph of Christiania. It lies in 59° 39′ N. lat. and 10° 28′ E. long. The town is divided into three quarters, of which Bragnaes is situated on the northern, and Stroemsoe and Tangen on the southern bank of the river: they are united by a flying-bridge. Bragnaes consists of a row of houses about a mile in length. Altogether, it is a lively town; the main streets are chiefly composed of storehouses. Tangen is, in fact, the roadstead and landing-place, and is consequently the resort of mariners, fishermen, and small dealers. Drammen has a parish church and two filial churches, two superior and several elementary schools, and manufactures of leather, tobacco, sail-cloth, oil, &c. The number of houses is about 1000, and of inhabitants about 6000. It is extensively engaged in trade and navigation, in building ships, and in the export of timber, deals, iron, &c. The water in the harbour is of depth sufficient to allow all vessels to lie alongside the quays and other landing-places. There are marble quarries in the vicinity.

DRASTICS. [Cathartics.]

DRAVE, or **DRAU**, a river of Austria, which rises from a bed of limestone on the Toblacher Heide, or heath, near Innichen, in the western part of the Tyrol. It then descends in a south-easterly direction to Villach, in Carinthia, whence it flows easterly as far as Mahrburg in Styria: it then winds, chiefly south-eastwards, until it falls into the Danube, about 13 miles below Eszeg, in Croatia, close to the castle of Erdödy, which lies on the right bank of that river. The whole length of the Drave, from its source to its junction with the Danube, is about 300 miles. It becomes navigable at Villach. Its tributaries are the Muhr, or Mur, which joins it at Legrad; the Guil, which rises in the Carinthian Alps, near Villach, and falls into the Drave below Cszaktornya; the Gurk, Glan, Lavant, &c. The valley of the Drave, which commences not far from Innichen, in the Tyrolese vale of the Puster, runs by Lienz, Sachsenburg, Villach, Mahrburg, and Pettau, until it approaches Varasdin, in Croatia, from which point the river flows through a level country. The valley is bounded by mountains nearly as far as Spital, from which point they sink to gentle elevations, and the valley grows wider: the hills again approach, within a short distance, on each side of the river, near Villach, and skirt the Drave as far as its confluence with the Glan. The valley of the Drave is confined to a breadth of a hundred paces near Kossig, and is narrowed to a few feet of towing ground near Sen as well as between Saldenhofen and Mahrenberg. In its descent from Mahrburg, the Drave is accompanied, on its left bank only, by a range of heights, which continue as far as the neighbourhood of Pettau and Friedau, where the precipitous sides of the Mutzel mountains form its right bank. The current of the Drave is very rapid until it reaches Sclavonia, where it flows sluggishly, forms swamps, and occasionally inundates the low country. Gold-dust is found in this river.

DRAWBACK, in commerce, is a term used to signify the sum paid back by government on the re-exportation of goods, upon the importation of which an equal sum has already been paid as duty. The object of this repayment is to enable the exporter to sell his goods in foreign markets unburthened with duties; and it is clear that if duties are required to be paid on the first importation, no transit trade can possibly be carried on unless drawback is allowed by the government. Payments of this nature, although they are sometimes confounded with bounties, are in principle essentially different from them. [Bounty.] Previous to the establishing of the warehousing system in this country in 1803, and when the payment of duties on all foreign and colonial merchandise, with the exception of tobacco and East India goods, was required on the first importation, drawbacks were in all cases allowed upon re-exportation. This course was injurious, not only to trade, but also to the revenue. It was injurious to trade, because of the large capital which was necessarily employed, and it was prejudicial to the revenue because it gave rise to numerous and ingenious fraudulent expedients, by means of which greater sums were received for drawback than had been originally paid by the importers; besides which, the machinery required for the collection and repayment of duties was more complicated and expensive than would otherwise have been necessary. The amount of customs duty collected in Great Britain before the passing of the warehousing act in 1803 was usually from twice to three times as great as the sum paid into the exchequer, the greater part of the receipts being absorbed by drawbacks, bounties, and charges of management.

The only articles upon which drawback was paid at our custom-houses, and the amount of repayment in 1836, were as follows:—

Coffee	£72	14	0
Rice in the Husk .	10,804	14	2
Thrown Silk .	52,488	17	5
Sugar . . .	556,153	15	5
Tea . . .	21	11	2
Timber . . .	81,987	1	5
Tobacco and Snuff .	18,735	16	5
Wine . . .	60,889	10	6
Total . .	£781,154	0	6

The drawback on timber is not indeed a payment made on its re-exportation, but an allowance upon such quantities as are used in the mines. The quantities of thrown silk, sugar, and tobacco entitled to drawback had already paid duty previous to their undergoing a manufacturing process, and drawback on wine is only paid when exported in bottles, for transferring it to which from the cask it was, until lately, necessary to pay the duty: by a recent regulation wine intended for exportation may be bottled in the warehouse without paying duty. There is every reason to conclude that the payments made on the exportation of refined sugar are not purely drawback, but partake of the character of bounty, the price of the raw sugar being uniformly higher in our markets than in the countries to which the refined goods are sent.

DRAWBRIDGE, a bridge used in antient castles and in modern fortresses over a ditch or fosse, and capable of being raised up at one end so as to cut off the means of access. Drawbridges for this purpose are usually formed of boards nailed to a frame forming a platform, which is furnished at one end with hinges fastened to a beam placed parallel to one end of the frame. The bridge is raised by means of chains passed through the masonry of the gate. These chains are worked either by wheels or by hand, and thus the platform is raised to a perpendicular.

'When drawbridges are made close on the outsides of gates, the masonry ought to be sunk so as to admit of the whole depth of the frame to lie within it, else the oblique fire from the besiegers' batteries would act on the edge of the frame and soon render it unserviceable.' Nicholson's *Dict.* Fortified towns, such as Portsmouth and Calais, have drawbridges.

DRAWING, in its strict meaning, is the art of representing objects on a flat surface by lines describing their forms and contours alone, independently of colour or even shadow, although the latter is closely allied with drawing, both in practice and in theory; because, notwithstanding form may be clearly expressed by outline alone, shadow, while it gives surface and substance, is dependent upon form, and in many cases requires to be accurately defined according to the rules of perspective. More particularly is this the case when shadows are cast from any regularly shaped body upon one or more planes, as, for instance, the shadow from a column upon a flight of steps, or that of a man upon the ground and a wall; which natural profile, as that of a human figure against a wall, has been supposed to have first given rise to the idea of delineating the contours of solid bodies, by tracing their outlines. It is true, that except in geometrical forms with sharp edges, very few such lines exist in nature, outline being no more than the boundary of surfaces as it exhibits itself to the eye. Thus, in the case of a globe or a cylinder, there are no lines whatever in the one, no edges down the latter; their outline being not on any part, but merely the termination of that portion of it which is visible. The same holds good with respect to the human form, and to that of animals, whose limbs have no determined edges, but consist of parts more or less curved, and even when nearly flat—take for instance the palm of the hand—never stopping so as to form a specific line or positive edge. The outline of the superficies will consequently vary according to the direction in which the object itself is viewed. Alluring as colour is to the eye, and principal as it seems to be in painting, it is really subordinate to drawing, because unless assisted by form, it is nearly valueless and unmeaning, incapable of expressing any thing; whereas form can distinctly represent objects without the aid of colouring, or even that of shadow, which latter is the adjunct and ally of the other two, being governed by both, inasmuch as form determines the position of shadows, colouring their proper tone and hue.

Although Drawing embraces all objects and their forms, in its more restricted technical sense, it is generally understood to imply the drawing of the human figure, as that species of it which is the most scientific in itself and the most important in art. Landscape painting requires comparatively little skill in drawing and no great exactness of hand, since the forms it deals with, such as those of trees, hills, rocks, birds, &c., being altogether irregular, general fidelity as to form is sufficient; while fidelity of colouring and aerial perspective, and the effect of light, are the qualities most essential to it. Colouring, indeed, may be said to be the very soul of landscape painting, for divested of that and reduced to mere outline, it loses its greatest charm, and nothing remains of it save the composition alone of the particular subject. Such, however, is not the case with historical painting, the chief merits of which are intimately connected with and capable of being displayed by outline alone. The painter of landscape, or of inanimate objects and mere imitative subjects, such as still life, &c., can trust to his eye alone, and even for perspective he has little occasion beyond an acquaintance with its general laws. Besides which his models are permanent and stationary, subject to little variation except in regard to certain casual and transitory effects of light and colour, that require to be hit off instantly; and therefore their forms may be studied and copied without difficulty. The same remark applies to those of the architectural draftsman, who has moreover the advantage of being able to apply the rules of perspective with unerring certainty upon every occasion. Far different is it with respect to drawing the human figure or animals, because, though their forms are regular and symmetrical, and require to be represented with the utmost correctness, they do not, like geometrical figures, admit of being delineated by the technical operations of perspective, since they consist of undulating surfaces and contours, whose perspective appearance and outline, according to the precise direction in which they are viewed, can be determined by the eye alone. Greater correctness of eye and expertness of hand are required to draw even a statue than a tree; the nicest observation of all the proportions, the most scrupulous attention to every lineament, to every minute detail, to every marking, every gradation of shadow however slight, are indispensable. Yet in such case the draftsman has nothing more to do than patiently copy a perfectly immovable object. But how incomparably more arduous than such task is that of representing similar forms taken from the living subject. Here, unless he be also well disciplined and grounded in anatomical knowledge, the best models will avail him little save as studies of proportion, and of such positions and attitudes as, although they are intended to express motion, can yet be preserved for a considerable time. He may, indeed thus perfect himself in that particular species of anatomical perspective which is termed foreshortening, and he may do much in the way of training both his hand and his eye, yet for direct action and motion his model will serve only to inform him what muscles they are that are brought more forcibly into play, and other transitory phenomena that disappear almost as soon as they exhibit themselves. Indeed some motions are so exceedingly rapid and fugitive that they can hardly be studied at all from the life, but if attempted to be shown in painting, must be represented according to theory, based upon the most exact anatomical knowledge. Some attitudes and motions are either so exceedingly evanescent, as those of the figures hurled down in Rubens's picture of the Fallen Angels, or so purely imaginary, as when angels or winged genii are represented hovering in the air, that such theory alone will enable the artist to express them with any degree of apparent fidelity. The extremities, that is, hands and feet, are among the most difficult parts of the figure, and require great practice in drawing. Drapery, again, is, next to the figure itself, of the greatest importance, while it is less reducible to any positive rules for disposing it.

In order to attain to a complete mastery of the human figure, which after all is to be regarded only as the means to a higher aim, and the mechanical apparatus for effecting it, it is necessary to commence by studying what is tedious in itself, and seems almost foreign to the artist's purpose, namely, the internal configuration of the human frame. It is not enough to understand the proportions of the body and limbs, with the form and situation of the external muscles, but it is necessary that all the muscles, their purposes and functions should be well understood; nor must osteology, or the bones of the skeleton, be neglected. Indeed it is desirable that the artist should be able to draw the skeleton figure in any attitude, by which his figures will always be well put together. By way of practice in this respect, it has been judiciously recommended that as soon as he is a perfect master of the skeleton, the student should proceed to draw antique statues in that state, afterwards clothing them with muscles, as in the marble or cast before him. Without scientific knowledge of muscular action, the painter will be able to give his figures only attitudes, and those not always correct, should he have occasion to represent such as from their nature do not admit of being copied from the life. Unless, besides possessing a complete knowledge of the human body and the action of the limbs and muscles, he is also able to express the emotions of the mind, and that not as they display themselves in the countenance alone, but in gesture, attitude, and the whole frame, he will at the best produce only clever academical figures, skilfully drawn, but devoid of soul and sentiment. He must therefore endeavour to make himself master of expression, in the most comprehensive meaning of that very arduous and complex study, which, be it observed, depends entirely upon drawing and truth of delineation. For this purpose such works may be recommended as Bell's 'Anatomy of Expression.'

Perspective, which is generally treated of separately, and is therefore ordinarily considered a distinct study, is nevertheless a most essential part of drawing,—in fact its very grammar, all objects being subject to its laws, although, as already observed, they do not admit of being delineated according to the processes employed for drawing buildings, furniture, and such things as consist of strict geometrical forms. Yet even to those who may seldom have occasion so to apply it, it is eminently serviceable, were it only because it trains the eye, habituating it to notice the effects of position and distance, and affording ready and certain assistance, and an unerring test of correctness, in what might else be matter of perplexity and doubt. Abstruse too as it may seem in theory, and tedious in its application, its principles are few and simple, and subjects the most intricate and complex, and consequently operose in their delineation, demand no particular skill, but merely attention and patience alone. Reserving the science itself for the article **Perspective**, we only advert to it here in order to press upon the student its importance, and that, instead of being an extraneous accomplishment, it is so inseparably connected with drawing, that it must of necessity be observed to a certain extent, although with no other guidance than what is derived from the eye, or else there will be no resemblance to nature; for perspective itself is based upon the laws of vision, and consists of practical rules deduced from them. It is true we frequently meet with glaring errors as regards both perspective and accuracy of form in the productions of many who are otherwise clever painters; yet so far from authorising similar negligence, in themselves they are imperfections which, although they may be redeemed by considerable merit in other respects, are nevertheless a drawback upon it.

The student would therefore do well to exercise himself thoroughly in drawing before he proceeds further; and the longer he confines himself to outline, with no other degree of shadow than what is necessary to express the character, the substance, or texture, and the different prominences or depressions in the superficies of objects, the more likely will he be to attain precision and correctness, as there will be nothing to conceal vagueness and inaccuracy of form, but form will be exhibited undisguisedly either in its beauty or the reverse. One great [illegible] wards correctness is to understand perfectly before[illegible] the object to be represented, its character both general [illegible] specific: when this is the case, the hand, supposing it to be sufficiently well trained, readily obeys the eye and the mind. Constant observation, therefore, and as careful [illegible] examination of objects as if he was preparing to draw them, will greatly promote the student's advancement, and [illegible] will be really learning, when, because he is not actually at work with his pencil, he may seem to be doing nothing.

Drawing, as far as regards facility in delineating common forms and objects so as to enable a person to describe them promptly with the pencil, ought to be considered nearly as indispensable a part of education as writing itself. By this, such a degree of proficiency is meant as would enable a person either to express or explain his ideas upon paper or to sketch from nature. Sketching, in the more popular meaning of the term, implies little more than the act of writing down in a kind of graphic shorthand the characteristic lineaments of a landscape or any individual object, an acquirement little more than mechanical, and which stands in about the same relationship to drawing, in its more elevated character, as an ordinary letter does to a finished literary composition. Like the sketcher, the draftsman only copies the objects before him, and those generally inanimate ones, but with this difference, that his drawings are expected to exhibit perfect fidelity, and admit of being worked up to a high degree of finish and beauty. Still he is no more than a transcriber: he may display his taste and judgment as well as his accuracy; he may fully enter into the spirit [illegible] what he represents, and set it forth to view in a very captivating manner, but without exercising any degree of inventive faculty; whereas drawing, as far as it is synonymous with design, comprehends invention and composition, the plan and idea of the whole subject.

There are various manipulations or modes of drawing distinguished according to the materials or implements made use of, such as chalk, black lead pencil, sepia or [illegible] tinted drawings; which last-mentioned class are sometimes called washed drawings, in which some indication of [illegible]ing is occasionally introduced. But what is termed water colour drawing, as now practised, is altogether a species of painting, although the process is totally different from [illegible] of oil colours, or even distemper. Pen and ink drawings in the style of etchings, either with or without the addition of wash of shadow, are capable of producing considerable effect.

Painters' drawings or studies, such as those of the [illegible] masters, are highly valuable because they often ex[illegible] their first conceptions in all their energy, and admit us [illegible] immediate intercourse, as it were, with their ideas as they arose in their minds.

The invention of Lithography has been applied with g[illegible] success in Germany to making fac-similes of such drawings: it also enables artists to make drawings at once upon [illegible] from which impressions may afterwards be taken [illegible] equivalent to autograph delineations, and of course excellent practical studies for beginners, as to handling and management of the pencil.

DRAYTON, MICHAEL, was born at Harshull [illegible] county of Warwick, in the year 1563. His life is [illegible] in great obscurity, and different circumstances con[illegible] him are rather conjectured than affirmed. It is su[illegible] that he went to the University of Oxford, but without [illegible] any degree, and also that he was in the army at an [illegible] period of life. Nine or ten years before the death of Q[illegible] Elizabeth he is said to have written poems. His [illegible] work was published in 1593, under the title of the '[illegible]herd's Garland:' it was afterwards revised and repri[illegible] 1619, under the name of 'Eclogues.' It is a col[illegible] pastoral poems, among which is the ballad of '[illegible] extracted in Percy's Reliques. Shortly after the '[illegible]herd's Garland' appeared his long historical po[illegible] Barons' Wars,' 'England's Heroical Epistles,' &[illegible] 'Polyolbion,' a descriptive poem on England, [illegible] productions and legends, made its appearance [illegible] This is the most celebrated of all his works: inde[illegible] of its merits as a poem, the most respectable a[illegible] refer to it for information, and consider it as auth[illegible] 1626 we hear of Drayton as poet-laureate. He [illegible] 1631.

The merits of Drayton as a poet are truly g[illegible] historical poems have about them a heavy ma[illegible] the most gorgeous images and the boldest descr[illegible] low in stately array, clothed in well-turned and ap[illegible] verse but unfortunately the obscurity of [illegible] them exceedingly unattractive. The construction is [illegible] painfully involved: a nominative case is often parted from its verb by an interval of six or seven lines; and hence, though these poems contain but few obsolete words, the reading of them is a serious study. The same observations will apply to the 'Polyolbion,' which is an immense mass of good sterling matter. All the birds and rivers of England are named one after another, but the descriptions are so close, that what we gain in instruction we lose in amusement. This poem is written in Alexandrines, and the measure is admirably managed. 'The Wars of the Barons' are written in ottava rima. Drayton has left one work which, in its way, has never been surpassed—a short fairy poem, called 'Nymphidia.' A more elfin work than this could not be penned: the author has contrived to throw himself into the feelings of the diminutive beings whom he represents. His descriptions of helmets made of beetles, earwigs being used as chargers, and other oddities of a like nature, display the very highest powers of fancy: a Liliputian air breathes through the whole performance. Had Drayton written nothing but 'Nymphidia,' he would deserve immortality.

As few persons, except those who make the reading of English poetry a regular study, could be persuaded to go through the ponderous works of Drayton, we cannot recommend the general reader to a better book than Campbell's 'Selections from the British Poets,' where a specimen is given of every style in which this fine old author wrote.

Drayton has a tomb in Poet's Corner, Westminster Abbey.

DREAMS may be best described, in a few words, as trains of ideas presenting themselves to the mind during sleep. The person, to whose mind ideas present themselves in trains during sleep, is said *to dream*, and the word *dreaming* designates either the state of the mind in dreams, or else the susceptibility or potentiality of having dreams. We use the word in the former sense, when we speak of 'the state of dreaming;' in the latter, when we say that 'dreaming is a part of man's nature.'

It is the principal design of this article to present the reader with the *psychological* theory of dreams: to explain, first, the psychological law by which dreams, as being trains of ideas, are regulated, and to exemplify the operation of this law; and, secondly, by means of this law and of certain psychological circumstances peculiar to the state of sleep, to explain the differences existing between dreams, as being trains of ideas which occur in the state of sleep, and trains of ideas as they generally occur in the waking state. When dreams, as psychological phenomena, shall have been thus explained (in the scholastic phrase) *per genus et differentiam*, the reader will be in possession of the whole psychological theory of dreams.

But dreams may give rise, as they frequently have given rise, to an inquiry other than the psychological inquiry which we have indicated, viz., one which in common speech is called a *physical*, but which would be better called, by coining a word analogous to psychological, a *somatological* inquiry. Besides observing the mental phenomena of dreams, and referring these phenomena to a mental or (as we have before termed it) psychological law, together with certain psychological circumstances peculiar to the state of sleep, men may speculate on the manner in which the state of the body in sleep affects the mind—how the body when asleep is affected, and how again the body thus affected operates to the production of the phenomena of dreams. Of this physical or somatological inquiry, the greater and more important part, that which relates to the state of the body, belongs properly to the subject of sleep; while, as regards the manner in which the state of the body operates to the production of the phenomena of dreams, to determine which observation gives very small assistance, we shall state, in a second division of this article, the little that can be relied on.

In the third part of the article we shall give a few well-attested instances of dreams, accompanied by circumstances which, as they are related, do not seem to admit of explanation. And this will lead us naturally to say a few words concerning the supernatural character which, at different times and in different countries has been attributed to dreams.

I. We have said that dreams are trains of ideas presenting themselves to the mind during sleep. Occasionally, and under peculiar and definable circumstances, *sensations* are felt during sleep; some of which commonly do not awake the dreamer, while others, which awake him, are yet shown to have been felt during sleep by the circumstance that a train of ideas called up by them passes before the mind, invested with the attributes of dreams, in an interval between the sensation and the waking. These sensations, however, are, from the nature of the case, comparatively so few, and, even when they are felt, so unimportant in comparison with the ideas which they call up, that they may very well be excluded from notice in a general description of dreams.

Bearing in mind then the existence of these few and unimportant exceptions, we shall henceforward speak of dreams as consisting only of ideas. And that the feelings composing dreams, which are at the time believed to be sensations, are not sensations, but only ideas,—that we do not see, hear, smell, taste, and touch what we believe at the time that we respectively see, hear, smell, taste, and touch, but that we only have the ideas of these respective sensations, cannot need proof. At any rate, the only proof which the nature of the case admits is one to be furnished by each individual for himself. Knowing the circumstances which, when he is awake, are concomitant with the having the feelings called *sensations*, and the circumstances which are concomitant with the state of sleep and of dreaming,—knowing further that these two sets of circumstances are incompatible with one another; while, on the other hand, the circumstances concomitant, when he is awake, with the having the feelings called *ideas*, are such that he may very well have them likewise when he is asleep; he cannot but conclude for himself (and if he do not, other means of proving it to him there are none) that the feelings of which he is conscious during sleep are not, as at the time he believes them to be, sensations, but ideas. He knows that when he is asleep and dreams, he is so situated that he cannot have the sensations which at the time he believes that he has. He knows that he *may*, in his then situation, have ideas; and, if he has any feelings at all, *must* have ideas. He must conclude then that what at the time he believes to be sensations are in reality only ideas, and must consider the appearance of these ideas as sensations, as a matter to be explained by means of psychological circumstances peculiar to the state of sleep.

Dreams, then, being thus assumed to be trains of ideas, we proceed to investigate the law by which they are regulated, and to exemplify the operation of the law.

On observing, or (to use the phrase which, when mental phenomena are spoken of, is more common) reflecting upon, our waking trains of ideas, we find that when two sensations, or two ideas, or a sensation and an idea have occurred in proximate succession, the sensation that occurred first, or its idea, or the idea that occurred first, is afterwards followed by the idea of the sensation that occurred second, or (as the case may be) by the idea that occurred second, and that this happens the more surely in proportion as such proximate succession of the two sensations, or two ideas, or sensation and idea has been more recent, and in proportion as it has been more frequent. Such is a brief statement of what is called the law of association, and of its laws. [Association.]

'When a man thinketh on any thing whatsoever,' says Hobbes, 'his next thought after is not altogether so casuall as it seems to be. Not every thought to every thought succeeds indifferently. But as we have no imagination (idea), whereof we have not formerly had sense in whole or in parts; so we have no transition from one imagination to another, whereof we never had the like before in our senses.' (*Leviathan*, i. 3.) Hobbes has here enunciated the principle of previous proximate succession, or contiguity (whatever it may be called), and has spoken of it as the sole primary principle of association; the only defect in the manner in which he has enunciated it being the omission of the instances of two ideas, and of a sensation and idea occurring in proximate succession. Most subsequent writers on the subject have added other primary principles, more or less, to this one enunciated by Hobbes; and in so doing are, we think, chargeable with an imperfect analysis. Mr. Hume enumerated three principles, contiguity in time and place, causation, and resemblance; a fourth, contrast, which he named, he looked upon as a secondary principle resolvable into causation and resemblance. (*Essays*, vol. ii., p. 21.) Dr. Brown, finding great fault with Mr. Hume's enumeration, and observing that all suggestion (the phrase employed by him in the place of association) depends on prior co-existence (by which he means the same as we by proximate succession), nevertheless does not seem to have perceived the processes by which resemblance and contrast may be resolved into this principle, and furthermore treats the topic under the threefold division of resemblance, contrast, and contiguity in place or time, all which he inconsistently calls primary principles. (*Lect.* 34 foll.) Mr. Mill has two principles, subdivisions (and perhaps unnecessary subdivisions) of the one principle, as it is represented by Hume and Brown, contiguity; he calls them the 'synchronous order,' which, he says, answers to contiguity in place, and the 'successive order,' which, he says, answers to contiguity in time. (*Analysis of the Human Mind*, vol. i. p. 53.) He observes rightly, that the principles of causation, resemblance, and contrast, may be resolved into previous proximate succession; though he does not go through the analyses, and indeed the few hints which he gives of what he deems the necessary processes seem to show that he did not understand them.

The mode of resolving causation is obvious; causation indeed is but a name for previous proximate succession, under particular circumstances. Let us briefly explain (Mr. Mill not having done it) the modes of resolving resemblance and contrast into the same principle; taking, which is the most convenient method in such cases, a particular instance of each.

The sight of a man, A, calls up the idea of another man, B, who resembles him. Some of the sensations and ideas which are elements of the complex feeling called *the sight of A*, have been before present to the mind as elements of the complex feeling called *the sight of B*; and these sensations and ideas call up the ideas of the other sensations and the other ideas which go to make up the complex feeling called *the sight of B*, and which are not elements of the complex feeling called *the sight of A*; for with these other sensations and other ideas they have before existed in proximate succession, or (as we may say for shortness) have co-existed. These ideas, thus called up, co-exist (as we may again say for shortness) with the ideas of the sensations, and with the ideas, which, belonging both to the sight of A and the sight of B, called them up; and thus the idea of the sight of B, or the idea of B, is present to the mind.

Again, as regards contrast, the idea of a giant calls up the idea of a dwarf. One idea that is an element of the complex feeling called *the idea of a giant* is the idea of tallness, which idea is made up of the idea of height and that of greatness. The idea of tallness, and therefore that of height, is a vivid idea, or (changing the phrase) it is an idea on which the mind dwells, or which very frequently presents itself to the mind when a giant is being thought of; and so when a dwarf is being thought of, is the idea of shortness, which again includes the idea of height, a vivid idea. Now the idea of height being a vivid idea, or one which very frequently presents itself to the mind when a dwarf is thought of, is strongly (and strongly by reason of the frequent proximate succession of the two ideas) associated with the idea of a dwarf, as it is, for the same reason, strongly associated with the idea of a giant. The idea of the giant then calls up the idea of height, which has frequently before (as we may say for shortness) co-existed with the idea of the giant; and the idea of height thus called up calls up, for the same reason, the idea of the dwarf.

We have dwelt thus at length on the psychological law of association, and its primary principle of previous proximate succession, because it may be said to be the key to the whole psychological theory of dreams. This law being fully comprehended at the outset, so much of the remainder of our task as consists in the exemplification of its mode of operation is made straightforward and easy.

We arrive at the law of association, as determining waking trains of ideas, by the processes of observation and of induction. We may either extend the law, thus arrived at in the case of waking trains of ideas, to the case of dreams, knowing independently that these are made up of ideas, and are therefore not different in kind from waking trains; or again we may arrive at the law, in the case of dreams separately, by the same processes of observation and induction. The former mode is as satisfactory as the latter; and in the way of this latter there are many difficulties, arising out of the nature of the case, which do not exist as regards [illegible]er. By the former mode, therefore, which is the easier, [illegible]h is at the same time logically correct, we come [illegible]clusion that, in dreams, one idea is followed by another idea, when either the sensation of which the first is the copy has, at a previous time or times, been followed by the sensation of which the second is the copy, or when one of the ideas has followed or been followed by (as the case may be) the sensation of which the other is the copy, or again when the ideas themselves have been, at a previous time or times, present to the mind in proximate succession; and that this happens the more surely, or (changing the phrase) the association between the two ideas is the more strong, in proportion as the previous proximate succession has been more recent, and in proportion as it has been more frequent. Of the law thus modified by the circumstances of recency and frequency, *causation*, *resemblance*, and *contrast*, are names for classes of instances; and in dreams, as in waking trains, the idea of what is called a cause is generally followed by the idea of what is called its effect; the idea of an object which resembles another object is generally followed by the idea of the object which it resembles; and the idea of an object which is said to be contrasted with another object is sometimes followed by the object with which it is said to be contrasted. We will now exemplify, with somewhat more particularity, the operation of this law of association in dreams.

1. The classes of associations which make up the greater part of our mental history when we are awake, those concerned in naming, in classification and abstraction, in memory, in belief, in reasoning (whether to ourselves or by word of mouth or in writing), in imagination, in desires and aversions, in affections, occur likewise during sleep, and make up a considerable part of our mental history in sleep, that is, of our dreams. It will not be necessary to give instances of the occurrence of each of these classes of associations, as every one who is conscious of having dreamt must be conscious of having had these several states of mind during his dreams. And further, the giving of the instances would be of little use, unless the instances given of the several states of mind were analysed, and the associations forming these several states of mind set forth in the particular instances given; but this, even were it relevant to our present purpose, would carry us to an unreasonable length. Referring the reader then to Mr. Mill's masterly work, entitled the 'Analysis of the Human Mind,' in which the working of the law of association is thoroughly developed, we shall content ourselves with some striking instances of reasoning and imagination, and with an exemplification of belief, of that kind which is most important for the full comprehension of dreams.

We not only converse, in dreams, with the persons whom we believe to be present, speaking to them, and again attributing to them connected words which we believe that they speak to us, but we frequently go so far as to make a speech or written dissertation, which, as remembered when we have awoke, is not only coherent, but often (owing to psychological circumstances peculiar to the state of sleep) more clearly and forcibly arranged than it would have been had we been awake, and had we actually spoken the speech or written the dissertation. Condillac is said to have often brought to a conclusion in his dreams reasonings on which he had been employed during the day, and which he had not completely worked out when he retired to bed. (Cabanis, *Rapports du Physique et du Moral de l'Homme*, ii. p. 395.) Cabanis says, in the same page, of Franklin:—'I knew a very wise and enlightened man who believed he had often been instructed in his dreams concerning the issue of events which at the time occupied his mind. His strong head, and his freedom, in every other respect, from prejudice, had not been able to guard him against a superstition in respect of these inward warnings. He observed not that his profound skill and rare sagacity continued to direct the action of his brain during sleep.' The circumstances under which Mr. Coleridge composed the fragment called 'Kubla Khan' have been described by himself as the following, and we see no reason to discredit his statement.* 'He had taken an anodyne which had been prescribed to him in consequence of a slight indisposition, and fell asleep in his chair while he was reading in Purchas's Pilgrimage of a palace built by Khan Kubla, and remained asleep for about three hours, during which, as he himself tells us, 'he could not have composed less than from two to three hundred lines; if that indeed can be called composition in which all the images rose up before him as things, with a parallel production of the correspondent expressions, without any sensation or consciousness of effort.' On awaking he instantly sat down to commit his poem to paper. After having written so many lines as were afterwards published, he was interrupted by a person on business; and when he returned to the task the poem had vanished from his memory. The fragment begins thus:—

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* This account was ridiculed in the 'Edinburgh Review' (vol xxvii. [illegible]) in one of a series of articles on Mr. Coleridge, concerning the truth and [illegible] of which the world has now very unequivocally expressed its opinion. A[illegible] arguments are adduced in support of the reviewer's denial of Mr. Co[illegible] statement we consider ourselves justified in retaining our own faith there[illegible]

'In Xanadu did Kubla Khan
A stately pleasure-dome decree:
Where Alph, the sacred river, ran
Through caverns measureless to man
Down to a sunless sea.'

The poem proceeds as one stream of melody; and the diction is throughout beautifully appropriate and condensed. (*Poetical Works*, i. p. 266.)—There are many trite instances, which we shall only thus generally allude to, of writing performed during sleep, under the particular circumstances which constitute somnambulism. These particular circumstances, it will be observed, affect the body only, and in no-wise affect the mind or its operations.

Our belief in the presence of external objects not present is one of the most curious and, from the frequency of its occurrence, together with its curiousness, one of the most important of the phenomena of dreams. This belief is a complicated case of association. When we are awake, and, having sensations of sight from a present object, believe that the object is present, we have, first, the sensations of sight which the object excites, then the ideas of distance and extension and figure, which are closely associated with these sensations: again, the ideas of all the other sensations which the object has at other times and in other circumstances excited (those of resistance, smell, sound, &c.), and of ourselves as having these sensations: and, lastly, the idea of a cause of all those sensations, whether present or past, whether those which are themselves, or those of which only the ideas or copies are present to the mind. All those ideas, inseparably associated with the sensations of sight of which we are conscious, make up the complex state of mind called *belief in the presence of external objects*, or *belief in the existence of external objects present*. The same ideas, inseparably associated with the ideas of the sensations of sight which were themselves present in the former case, constitute another complex state, which is also a state of belief in the existence of the external objects, but which, having ideas of the sensations of sight instead of the sensations themselves, is thus distinguished from the former state, and which may be called *belief in the existence of external objects not present*. This last state of mind is the one which occurs during sleep, appearing to be the former one. Why it so appears we shall explain presently. At present we have had to do only with what it actually is, and with the associations which it comprehends.

2. It is said that a man's character and pursuits influence his dreams. Now we mean by the phrase 'a man's character,' nothing more than certain classes of associations which occur to him most frequently; and his 'pursuits' again, viewed subjectively or in respect of himself pursuing, may be paraphrased in the same way. When we say then that a man's character and pursuits influence his dreams, it is only a way of saying that those associations which most frequently occur when he is awake will also occur most frequently, *cæteris paribus*, when he is asleep. This circumstance, therefore, observed in dreams, exemplifies the manner in which frequency strengthens association. It would be but a waste of words to bring particular instances in support of the general remark; and indeed it will be incidentally exemplified in some of the illustrations which we shall presently adduce of the influence of sensations on dreams.

3. Dreams turn upon subjects which have been present to the mind recently, rather than those which have been present to it at a greater distance of time. In other words, the most recent associations will recur, *cæteris paribus*, the most frequently in our dreams. As under the last head, therefore, was exemplified the influence of frequency on association, so under the present is that of recency exemplified; and it will not be necessary to dwell any longer upon this than upon the last topic.

4. We shall enter at rather greater length into the manner in which the sensations occasionally felt in sleep modify dreams through association. We have already alluded to the occasional occurrence of these sensations. They are themselves very unimportant parts of dreams, even when they occur; but they call up vivid and interesting trains of ideas, the connexion between which and the sensations it is amusing to trace. We shall take the different kinds of sensations separately.

a. Of the five external senses, sight is the least excitable during sleep. But a strong light brought before the eyes of a person sleeping generally affects the nerves concerned in the sensation of sight; a sensation of a light is generally felt; and whilst its ultimate effect is almost always to awaken the sleeper, a train of ideas associated with the sensation of a light is first called up, and passes before the mind in the interval between the sensation and waking. The sleeper probably awakes from a dream of some conflagration, whether one which has actually taken place (for instance, the conflagration of Moscow, or any other which may have been impressed on his mind), or else a conflagration of some house well known to him, perhaps even his own.

b. The least excitable of the senses, after sight, is taste. And even so far as it is excitable, the circumstances under which we sleep are such as to preclude almost entirely the possibility of its being brought into action. When, however, from ill-health, or in consequence of something which we have ate shortly before going to bed, there is (in the vulgar phrase) a bad taste in the mouth, this may have its effect on dreams. 'A bad taste in the mouth,' says Mr. Macnish, the author of a book called the 'Philosophy of Sleep,' which, however, is not exactly the book of a philosopher, 'presents us with everything bitter and nauseous in the vegetable world; a mercurial course perhaps with the mines of Spain, from whence that mineral is obtained.' (p. 69.)

c. Smell comes next of the senses, in respect of defect of excitability during sleep. The circumstances under which we sleep are again such as to preclude almost entirely the action of this sense; and it is difficult, while it is by no means important, to select an apposite instance of its operation in modifying dreams.

d. We come next to the sense of hearing. 'The sound of a flute in the neighbourhood,' says Mr. Macnish, 'may invoke a thousand beautiful and delightful associations. The air is perhaps filled with the tones of harps, and all other varieties of music; nay the performers themselves are visible; and while the cause of this strange scene is one trivial instrument, he may be regaled with a rich and melodious concert.' (p. 61.)—A loud noise taking place near the sleeper, heard by him, and eventually awaking him, calls up ideas of various loud noises, and these again various other ideas associated with them. The following curious instance, which exemplifies the tendency of ideas that have been most frequently and most recently present to the mind to recur in dreams, is taken from Dr. Abercrombie's work on the Intellectual Powers. At a time when the inhabitants of Edinburgh were all in constant alarm of a French invasion, and every preparation had been made for the landing of the enemy, it was further arranged that the first notice thereof should be given by a gun from the castle. 'A gentleman,' says Dr. Abercrombie, 'who had been a most zealous volunteer, was in bed between two and three o'clock in the morning, when he dreamt of hearing the signal gun. He was immediately at the castle, witnessed the proceedings for displaying the signals, and saw and heard a great bustle over the town, from troops and artillery assembling. At this time he was roused by his wife, who awoke in a fright, in consequence of a similar dream, connected with much noise and the landing of an enemy, and concluding with the death of a particular friend of her husband, who had served with him as a volunteer during the late war. The origin of this remarkable concurrence was ascertained, in the morning, to be the noise produced in the room above by the fall of a pair of tongs, which had been left in some very awkward position, in support of a clothes-screen.' (p. 277.)—Again, whispering in a person's ear when he is asleep is found sometimes to modify his dreams very considerably. Some persons, it is true, are instantly awaked thereby; others, who sleep on, are not conscious when they awake of having had dreams akin to the subjects on which the whisperer has discoursed; while others again may have their dreams modified at one time by the whispering, and not at another, according as the sleep is more or less deep. But instances are recorded of persons susceptible always, and, to a peculiar degree, of the influence of this whispering in the ear on their dreams. Dr. Abercrombie gives an amusing account of an officer in the expedition to Louisburg in 1758, on whom his companions in arms, knowing his susceptibility, used constantly to amuse themselves by practising the whispering. 'They could produce in him any kind of dream by whispering into his ear, especially if this was done by a friend with whose voice he was familiar. At one time they conducted him through the whole progress of a quarrel, which ended in a duel; and when the parties were supposed to be met, a pistol was put into his hand, which he fired, and was awakened by the report. On another occasion, they found him asleep on the top of a locker or bunker in the cabin, when they made him believe he had fallen overboard, and exhorted him to save himself by swimming. He immediately imitated all the motions of swimming. They then told him that a shark was pursuing him, and entreated him to dive for his life. He instantly did so, with such force as to throw himself entirely from the locker upon the cabin floor, by which he was much bruised, and awakened of course. After the landing of the army at Louisburg, his friends found him one day asleep in his tent, and evidently much annoyed by the cannonading. They then made him believe that he was engaged, when he expressed great fear, and showed an evident disposition to run away. Against this they remonstrated, but at the same time increased his fears by imitating the groans of the wounded and the dying; and when he asked, as he often did, who was down, they named his particular friends. At last they told him that the man next himself in the line had fallen, when he instantly sprung from his bed, rushed out of the tent, and was roused from his danger and his dream together by falling over the tent-ropes.' (p. 278.)

e. Of the five external senses, touch is the most excitable during sleep In continually changing, as we do, our position during sleep, we are influenced by tactile sensations of which the bed and the bed-clothes are the causes. We are most easily awaked by being touched, the slightest tickling in the nose or the sole of the foot being sufficient for the purpose. And as regards the operation of sensations of touch in modifying dreams, let it suffice to observe generally, that those by which we are awaked may call up, in the interval between the touch and the waking, ideas of various causes of touch which will be pleasurable or painful ideas according to other circumstances.

f. Sensations of bodily pain, or of disorganization (as they have been named by Mr. Mill, who has been the first to treat of the munder a separate head), including the sensations of heat and cold, frequently occur to modify dreams. Hobbes has enunciated this modifying circumstance with distinctness, interweaving however a somatological hypothesis for its explanation which is neither necessary nor correct; but this hypothesis may be kept apart from the enunciation of the fact. 'And seeing dreams are caused by the distemper of some of the inward parts of the body, divers distempers must needs cause different dreams; and hence it is that lying cold breedeth dreams of fear, and raiseth the thought and image of some fearful object (*the motion from the brain to the inner parts, and from the inner parts to the brain being reciprocal*); and that as anger causeth heat in some parts of the body when we are awake; so when we sleep, the over-heating of the same parts causeth anger, and raiseth up in the brain the imagination of an enemy.' (*Leviathan*, i. 2.)—Dr. Abercrombie furnishes us with the following instance of a dream caused by cold. Dr. Gregory, who had recently been reading an account of Hudson's Bay, dreamt one night that he spent a winter in that part of the world, and suffered intensely from frost; and upon awaking he found that he had thrown off his bed-clothes during sleep (p. 276). Heat arising from an accumulation of bed-clothes will lead to a dream of an opposite character, the particular ideas associated with the sensation of heat which come in to make up the scenes being dependent, as in the case of Dr. Gregory's dream, on particular circumstances.—The same Dr. Gregory having applied a bottle of hot water to his feet one night in consequence of indisposition, dreamt that he was walking up Mount Ætna, and felt the ground under him warm. Dr. Reid, having one night a blister applied to his head, dreamed that he was scalped by a party of Indians. (Abercrombie, *id.*; Stewart's *Philosophy of the Human Mind*, vol. i. p. 335.) The writer of this article, when suffering once from acute pains in the back during a rheumatic fever, dreamt that he was pursued by enemies, who were shooting arrows at him, and whose every arrow told.

g. Sensations in the alimentary canal, sometimes pleasurable and sometimes painful, have a very important influence on dreams. These sensations indeed influence very considerably our waking trains of ideas; and much more, inasmuch as in sleep there are no external objects to call us away from the ideas which these sensations call up, do they influence our sleeping trains. When the digestion is good, and we have ate nothing which weighs upon or disagrees with the stomach, our dreams are, generally speaking, pleasurable. When, on the other hand, we suffer from indigestion, which, in respect of the effect, is but a name for an aggregate of painful sensations in the alimentary canal, we are afflicted with dreams of the most painful character. The exhilarating effects of opium and of intoxicating draughts, which effects are neither more nor less than sensations in the alimentary canal, are also discernible in dreams. And in connexion with this topic, we may allude to the dreams caused by the uneasy sensations attendant on obstructed respiration, which, sometimes caused by and sometimes combined with indigestion, constitute the most dreadful evils to which in sleep we are subject, and which are known to all under the name of nightmare.

We have thus explained the law of association which determines the formation of dreams, and have exemplified its operation. Thus far, it will be observed, we have spoken of dreams only in their generic character of trains of ideas; or, at least, any reference which we have made to the specific circumstances which distinguish them from trains of ideas in the waking state has been incidental. It remains, in order to complete the psychological theory of dreams, to state and explain the circumstances distinguishing dreams, as trains of ideas during sleep, from trains of ideas as they generally occur in the waking state. We say as they generally occur, because in the waking state there are trains of ideas, which occur under peculiar circumstances, resembling dreams, and differing from the generality of trains of ideas in the waking state in those very points by means of which dreams, and the generality of waking trains, are to be distinguished from one another. The trains of ideas which in the waking state occur thus under peculiar circumstances are those called *reveries*, or, more expressively, *waking dreams*; and again those which present themselves to the mind during delirium.

1. Ideas which occur in dreams are believed to be sensations; scenes fashioned by the fancy are believed to be real. What has been already said, when we were resolving this belief in the presence of external objects not present into its component elements, in order to exemplify the operation of the law of association in dreams, has explained the explanation of this phenomenon. When we are awake we are conscious continually of two different states of mind: belief in the existence of external objects present, and belief in the existence of external objects not present. These two states of mind differ only in this point, that the former comprehends certain sensations of sight, while the latter, in the place of the sensations themselves, has the ideas of the sensations. Now, when we are awake, ideas are compared with sensations, the belief in the existence of external objects not present with the belief in the existence of external objects present; and ideas are seen to be less vivid than sensations, the former belief than the latter belief. Thus, and thus alone, are these states of mind respectively distinguished from each other when we are awake; but when we are asleep we have no sensations with which to compare our ideas, and no external objects present, with the belief in whose presence we can compare the belief in their existence when they are not present. Ideas therefore, no longer viewed relatively, take the place of sensations; they are the most vivid representations which present themselves to the mind of the qualities of external objects; and, being the most vivid, are believed to be sensations. Whence it follows that the belief in the existence of external objects not present takes the place also of the belief in the existence of external objects present, or (changing the phrase) the belief in the presence of external objects. It may also be, that ideas when we are asleep, from bodily causes which we cannot trace, actually are more vivid than are the same ideas when we are awake: if it be so, which we cannot positively say, but which is probable, it will combine with the previous consideration to explain the above-mentioned phenomenon.

Dr. Hartley wrote upon this point with great sagacity, and the only fault in the following extract is the introduction of a material hypothesis at the end of it 'The scenes which present themselves are taken to be real. Now this happens, first, because we have no other reality to oppose to the ideas which offer themselves, whereas in the common fictions of the fancy, while we are awake, there is always a set of real external objects striking some of our senses, and precluding a like mistake there, or if we become quite inattentive to external objects, the reverie does so far put on the nature of a dream as to appear a reality; secondly, the trains of visible ideas which occur in dreams are far more vivid than common visible ideas, and therefore may the more easily be taken for actual impressions. For what reasons these ideas should be so much more vivid, I cannot presume to say. I guess that the exclusion of real impressions has some share, and *the increased heat of the brain may have some likewise*. The fact is most observable in the first approaches of sleep, all the visible ideas beginning then to be more than usually glaring.' (*Observations on Man*, vol. i. p. 398, ed. 1810.)

Thus it is that we never dream of a past event as a past event. Any historical event of which we dream is believed to be taking place before our eyes, and any historical individual to be our companion. Another singular consequence is observable in the case of dreams produced by sensations of bodily pain. The sensation of the pain may call up, as well as kindred ideas of pain and its causes, an idea of that which will remove the pain, which, when we are awake, must often follow the sensation of pain; and this idea will be taken for the actual presence of that which is fitted to relieve us. When, for instance, we hunger or thirst in sleep, these uneasy sensations call up respectively the ideas of food or drink; we believe that we have food or drink in our possession, but (the hunger or thirst of course continuing) we go on to dream of some occurrence which prevents the satisfaction of our appetites; or perhaps we have the idea of the taste of the food or drink, and believe that we have the sensation of tasting, but yet the hunger or thirst is not allayed. Immediately some other viand or beverage presents itself to us; again are we debarred from the enjoyment, or again do we taste and profit not; and thus does the dream proceed until we awake.

The incongruity of dreams, or (in other words) the grouping of objects in our dreams which could not exist together in reality, results immediately from this mistaking of ideas for sensations. There is no more incongruity in the collocation of our ideas themselves during sleep, than in that of our ideas in the waking state. In both states they follow one another according to the same law. But when we have ideas of objects during sleep, we believe that the objects are themselves present; and though the collocation of the ideas is natural, and such as would excite no surprise in the waking state, the collocation of the objects is strange, and would then also excite surprise. Dreams, though only trains of ideas, are believed at the time (as has been explained) to be successions of objects; and when afterwards remembered as such, they seem strange and incongruous. Dryden's poetical description and instance may here relieve the weariness of our own prose:—

> 'Dreams are the interludes which fancy makes:
> When monarch reason sleeps, this mimic wakes,
> Compounds a medley of disjointed things,
> A court of coblers or a mob of kings.'

2. There being no sensations in sleep, as in the waking state, to break off the trains of our ideas, the associations which have been at any previous time or times formed between these ideas have more uninterrupted play when we are asleep than when we are awake. When we are awake, one idea calls up another, this perhaps a third, and thus a train of ideas is commenced, when of a sudden we see some object; the sensation then takes possession of the mind, and (in the common phrase) the attention is withdrawn from the train of ideas. When we are asleep this cannot happen; and an association between any two ideas has to give way only to a stronger association between one of them and a third.

The greater coherency, than if they were made by us when awake, of speeches or essays which we believe in our dreams that we speak or write, has been already noticed.

Thus it is that we often go through a repetition in our dreams with considerably greater ease than we can do it when awake. For the same reason again, ideas occur to us in our dreams of which we have not for a very long time been conscious when awake, and which we have been perhaps unable, when anxious to do so, to call up; and trains of ideas are gone through, which we have perhaps wished to complete, when awake, but to no purpose, inasmuch as the associations between the several pairs of ideas in the trains are too faint to bear up against the continual interruptions of sensations. These ideas and trains of ideas occurring in dreams, which we are unable to call up when we are awake, are said to have been forgotten. Dr. Abercrombie gives an instance of a gentleman who, having been something of a Greek scholar in his youth, had afterwards so entirely forgotten the language that he could not even read the words, but who often dreamt of reading Greek works which he had used at college, and in such manner as to understand them. (p. 284.) Sir Walter Scott relates a very extraordinary dream of this kind in his Notes to 'The Antiquary,' in the last edition of the Waverley Novels, to which we must content ourselves with referring the reader.

We may observe, that the same revival of long-forgotten ideas and trains of ideas takes place often during delirium, the similarity between our trains in which state and our dreams we have already alluded to. A very singular instance of such revival during delirium is related by Mr. Coleridge, in his 'Biographia Literaria' (vol. i. chap. vi.).

To this head is to be referred a remark generally made concerning dreams, that the mind exercises no control over the ideas which compose them, or (as it is otherwise expressed) that the mind does not exert its will upon them, as it does upon ideas composing trains in the waking state. The mind is not diverted from the trains of ideas which pass before it by the occurrence of sensations; thus it need not desire, as it continually does in the waking state, to have the ideas composing the trains rather than the sensations; and thus the ideas are not presented to it, as they continually are in the waking state, in that particular combination which is called *desire of the ideas*, or *willing of the ideas*. This, we believe, is the full extent to which the remark concerning the absence of will (as it is called) over ideas in dreams is true; though, from the manner in which it is expressed, it seems, and indeed it is generally intended, to imply much more.

When we are awake, we are said to will bodily actions, and to will mental actions or ideas. Now, when we are asleep, we will bodily actions likewise; but from the manner in which the body is affected during sleep, the actions do not follow the state of mind called *will*, as they do when we are awake. We will to run from an enemy who, we believe, is pursuing us, but we cannot run; the muscles are so affected in sleep that their action does not follow the state of mind called *will*, as it does when we are awake. Every one who has dreamed must have experienced such a dream as this, and must remember the fear which follows it. But the circumstance that the action does not follow by no means affects the existence of the state of mind called *will* during dreams; and in sleep therefore, as in the waking state, we will bodily actions. Again, as regards mental actions or ideas, we exert our will over these, in the waking state, either by attending to them, or by endeavouring to recollect them, and in no other way; and every one who has dreamed must be conscious of attention to trains of ideas during his dreams, and of endeavours to recollect ideas. Thus neither as regards mental actions is there any absence during dreams of the state of mind called will.

The only difference in respect of this state of mind between dreams and waking trains is, as we have said, that in the former there is not so much need of attention to the ideas as in the latter; inasmuch as dreams are not interrupted by sensations, as are trains of ideas in the waking state.

3. Our measure of time during dreams appears not to coincide with that in the waking state. Having fallen asleep for a few moments, we believe that we go through, before we awake, a series of events which would occupy, did they really happen, days or months, or even years. And the same takes place often, when a sensation occurs to awake us, in the brief interval between the having of the sensation and the waking. Dr. Abercrombie gives the following instance, which will serve us as well as any other for illustration:—'A gentleman dreamed that he had enlisted as a soldier, joined his regiment, deserted, was apprehended, carried back, tried, condemned to be shot, and at last led out for execution. After all the usual preparations, a gun was fired: he awoke with the report, and found that a noise in an adjoining room had both produced the dream and awaked him.' (p. 279.) Again: 'A friend of mine,' says Dr. Abercrombie, 'dreamed that he crossed the Atlantic,

and spent a fortnight in America. In embarking on his return, he fell into the sea; and having awaked with the fright, discovered that he had not been asleep above ten minutes.'

This discrepancy between our notions of time when we are asleep and when we are awake may be very easily explained. The idea of time is only an idea of so many successions of events, or of ideas, whether called up by these events or otherwise. On looking back through any period of our mental history, if we remember many feelings that have succeeded the one to the other, we have the idea of a long time; if few, of a short one. Now ideas are remembered in proportion as they are interesting or vivid. In the waking state and in sleep the same ideas would pass before the mind during the same time; but in the waking state they would be viewed as ideas only, and the greater number would not be remembered. But in sleep they are believed to be sensations, the events thought of are believed actually to take place, and the ideas thus become interesting to such a degree that they cannot be forgotten. Looking back through these ideas, and remembering every one of them, we judge the time during which they have passed before the mind to have been a long time.

4. It remains to speak of the absence of surprise in dreams. It is not indeed true that the feeling of surprise is altogether absent from dreams, as is generally asserted; while in those cases in which it is absent, and in which its absence is thought worthy of remark, the explanation is simple. In our dreams we believe that we see persons who are either dead or in a distant country, and we are not surprised; we believe that we witness events which happened a very long time ago, and we are not surprised. Now we have the ideas of the persons and events, and we have not at the same time the ideas of the death or the distant country or the distant time at which the event took place; having the ideas of the persons and events, we believe these ideas, as has been already explained, to be sensations; and as we have not, together with the apparent sensations, the ideas of the death, distant country, &c., we have no ideas with which the apparent sensations are incongruous; and there being no incongruity, there is nothing to surprise us. We think of the persons or events, as we might think of them when awake, without certain additional ideas; and not having these additional ideas, we are not surprised at seeing, or believing that we see, the persons or events, any more than we should be surprised at seeing (could we by possibility do so) the same persons or events when we were awake, if we knew not that the person had died or was in another country, or that the event was one of history.

This explanation is confirmed by those instances in which we do feel surprise. The idea of a person or event believed to be seen may call up any of the additional ideas that have before been absent. We believe that we see a person, and we then think of his death; we are immediately surprised; and we dream that we are dreaming. Every one who has dreamed must have experienced such a dream as this.

II. This second part of the article was to contain so much of the little that is known concerning the state of the body in sleep as is relevant to the subject of dreams.

The organs of the five external senses are so affected by sleep, that the sensations which respectively pertain to them are either not felt at all, or are felt very much less often, and very much less, than when we are awake, and even when they are felt they generally awake us. But of this we have already spoken.

We have also spoken of the effects of sensations of bodily pain and of internal sensations on dreams. The manner in which sickness, through the medium of internal sensations, intensifies dreams, is familiar to every one.

It is a question whether sleep operates on the mind as well as on the body; whether, while it suspends the action of the body, it also, either through the body or otherwise, suspends the action of the mind. This is a question on which we cannot speak positively, and on which our opinion can be determined only by the greater *probability* of the one side or of the other.

Some writers assert that we do not always dream when we are asleep. They say that the proper effect of sleep is to suspend the action of the mind as well as of the body, and that, to the extent to which we dream, sleep is impaired. They speak of two kinds of sleep, the one in which we do not dream, and which they call *perfect* sleep; the other, in which we dream, and which they call *imperfect*. One of these writers is Mr. Locke, who has expressed a very decided opinion that during sleep we do not always think; his arguments in favour of the opinion being, that all of us are conscious of having no dreams during a considerable portion of the time that we sleep, that some persons even do not dream at all, and that a supposition that the dreams are forgotten almost the very moment after they have taken place is absurd. (*Essay on the Human Understanding*, 2, i. sec. ii.) If however we do not dream always, how is the beginning of our dreams accounted for? The mind is, on this supposition, at a particular period of sleep, void of ideas; an idea suddenly enters it, and dreaming begins. Now the idea was not called up by an idea antecedent to it, for antecedently there was no idea in the mind. How then did it come to enter the mind? This consideration appears to us adequate to set the question at rest as to whether we dream always or not.

Dreaming always, we may remember or forget our dreams according to whether our sleep is deep or slight, and remember them in proportion as it is not deep. One part of the same fit of sleep is more intense than another; the dreamer remembers the dreams of this latter part, but forgets those of the first, as regards which it is the same as if he had not dreamt at all. In one state of health the same person has a greater amount of deep sleep than in another; he in consequence remembers his dreams better, or (as he would most probably express it) he dreams more in the second state of health than in the first. Again, one person's bodily constitution is such as to make his sleep generally more intense than that of another person, and in consequence he is less of a dreamer. There have been instances of persons who do not remember ever to have dreamed, and of others who have not remembered any dreams until at a very advanced period of life.

III. As regards the instances of dreams which we propose to relate, there are three possible cases; they are either untrue, or true and explainable by ordinary or natural means, or else true and not so explainable, and therefore (in the common phrase) supernatural. Now these instances are so far authenticated, that we are not authorized altogether to discredit them. Not discrediting them, we are yet unable to explain them by the ordinary means: though it is possible, certainly, that as the dreams and their attendant circumstances come to us, there may be both some exaggeration in the dreams themselves, and some omission of incidents previous to the occurrence of the dreams which might help to explain the attendant circumstances. On the other hand, the instances (and we are about to give merely a selection) are numerous. And again, there is another set of incidents, also well authenticated, which, like these instances of dreams, are, if we believe them as they are related, unsusceptible of explanation by ordinary or natural means. We refer to the many stories told of the appearance of persons, at the moment of death, to friends or relations at a distance from the spot where the death takes place. Now these incidents pave the way to some extent for a belief in the supernatural character of such dreams as we are about to relate. If these incidents are believed to be supernatural, there is no reason why there should not also be supernatural dreams. We must observe however that in calling either the incidents to which we have referred or the dreams supernatural, we mean no more than that they cannot be explained by natural means. We cannot say how they were brought about; neither can we say, looking at the particular circumstances under which they happened and the particular persons to whom they happened, why they were brought about.

The first instance that we give is of a dream which occurred to a gentleman now alive, and which was related by him to members of his family who are also now alive, and to other persons, on the day after he dreamt it, and before the event which he seems to have foreseen in his dream was known. We extract the account of the dream, making some immaterial alterations, from a book called the 'Royal Book of Dreams,' in which it is given with the greatest particularity. 'In the night of the 11th of May, 1812, Mr. Williams, of Scorrior House, near Redruth, Cornwall, awoke his wife, and, exceedingly agitated, told her that he had dreamt that he was in the lobby of the House of Commons, and saw a man shoot with a pistol a gentleman who had just entered the lobby, who was said to be the chancellor; to which Mrs. W. replied that it was only a dream, and recommended him to go to sleep as soon if he could. He did so; but shortly after he again awoke Mrs. W., and said that he had, a second time, had the same dream. The same vision was repeated a third time; on which, notwithstanding his wife's entreaties that he would lie quiet and endeavour to forget it, he arose (then between one and two o'clock) and dressed himself. At breakfast the dreams were the sole subject of conversation; and in the forenoon Mr. W. went to Falmouth, where he related the particulars of them to all of his acquaintance that he met. On the following day, Mr. Tucker, of Trematon Castle, accompanied by his wife, a daughter of Mr. W., went to Scorrier House on a visit. Mr. W. related to Mr. T. the circumstances of his dream; on which Mr. T. observed that it would do very well for a dream to have the chancellor in the lobby of the House of Commons, but that he would not be found there in reality. Mr. T. then asked what sort of a man he appeared to be, when Mr. W. described him minutely. Mr. T. replied, "Your description is not at all that of the chancellor, but is very exactly that of Mr. Perceval, the chancellor of the exchequer." He then inquired whether Mr. W. had ever seen Mr. Perceval, and was told that he had never seen him, nor had ever had anything to do with him; and further, that he had never been in the House of Commons in his life. At this moment they heard a horse gallop to the door of the house; and immediately after a son of Mr. Williams entered the room, and said that he had galloped out from Truro, having seen a gentleman there who had come by that evening's mail from town, and who had been in the lobby of the House of Commons on the evening of the 11th, when a man called Bellingham had shot Mr. Perceval. After the astonishment which this intelligence created had a little subsided, Mr. W. described most minutely the appearance and dress of the man that he saw in his dream fire the pistol at the chancellor, as also of the chancellor. About six weeks after, Mr. W. having business in town, went, accompanied by a friend, to the House of Commons, where, as has been already observed, he had never before been. Immediately that he came to the steps at the entrance of the lobby, he said, "This place is as distinctly within my recollection, in my dream, as any room in my house;" and he made the same observation when he entered the lobby. He then pointed out the exact spot where Bellingham stood when he fired, and which Mr. Perceval had reached when he was struck by the ball, where he fell. The dress both of Mr. Perceval and Bellingham agreed with the description given by Mr. W. even in the most minute particulars.' This dream is related also by Dr. Abercrombie (p. 300), with a slight variation as to the time that elapsed between the dream and the announcement of the event, and with some additional circumstances.

The two following are among many instances mentioned by Dr. Abercrombie, who vouches for their truth. A Scotch clergyman, who lived near Edinburgh, dreamt one night, while on a visit in that town, that he saw a fire, and one of his children in the midst of it. On awaking, he instantly got up and returned home with the greatest speed. He found his house on fire, and was just in time to assist in saving one of his children, who in the alarm had been left in a place of danger. Two sisters had been for some days attending a sick brother, and one of them had borrowed a watch from a friend, her own being under repair. The sisters were sleeping together in a room communicating with that of their brother, when the elder awoke in a state of great agitation, and roused the other to tell her that she had had a frightful dream. 'I dreamt,' she said, 'that Mary's watch stopped; and that when I told you of the circumstance, you replied, "Much worse than that has happened; for ——'s breath has stopped also,"'—naming their sick brother. The watch, however, was found to be going correctly, and the brother was sleeping quietly. The dream occurred the next night; and on the following morning, one of the sisters having occasion to seal a note, went to get the watch from a writing-desk in which she had deposited it, when she found that it had stopped. She rushed into her brother's room in alarm, remembering the dream, and found that he had been suddenly seized with a fit of suffocation, and had expired. (Abercrombie's *Intellectual Powers*, pp. 289-302.)

The following is written in the fly-leaf of an old copy of Cruden's Concordance, belonging to a friend of the writer of this article. Its circumstantial manner of narration entitles it to belief; and the prediction of the beheading of Charles I. and of the fire to the old woman, is no more extraordinary than that of the death of Mr. Perceval to a gentleman who had never seen him, and was in no way connected with him. It is signed Richard [illegible], to whom, it is to be presumed, the Concordance once belonged; and it is dated September 14th, 1666, the year of the fire of London. 'In the yeare 1652, on the 25th day of May, Mr. Fortescue of Weare, in the county of Devon, a person of greate honours and sobriety, told me at Donnton in the said county, in the presence of my nephew, Roll, and other gentlemen of quality, that there was a woman of his knowledge, that was then living, that many yeares before the warres had a vision of them, and of the king's beheading, and amongst many other particulars, of the destruction of London. This I writ down in my Almanack for the yeare 1652, the same day it was told me with [illegible] under it; but it hath pleased God that for our sinne London is almost now consumed. I pray God we may all receive instruction by it.'

We shall conclude these instances with an account of two concurrent dreams furnished by Dr. Abercrombie, which were not, like those we have already given, followed by the event on which they are said to have turned, but of which the coincidence is very extraordinary. 'A young man, who was at an academy a hundred miles from home, dreamt that he went to his father's house in the night, tried the front-door, but found it locked; got in by a back door, and, finding nobody out of bed, went directly to the bed-room of his parents. He then said to his mother, whom he found awake, "Mother, I am going a long journey and am come to bid you good bye." On this, she answered under much agitation, "Oh dear son, thou art dead!" He instantly awoke, and thought no more of his dream, until a few days after, he received a letter from his father, inquiring very anxiously after his health, in consequence of a frightful dream his mother had on the same night in which the dream now mentioned occurred to him. She dreamt that she heard some one attempt to open the front door, then go to the back-door, and at last come into her bed-room. She then saw it was her son, who came to the side of her bed, and said, "Mother, I am going a long journey and I am come to bid you good bye;" on which she exclaimed, "Oh dear son, thou art dead!" But nothing unusual happened to either of the parties.' (p. 290.)

Instances of such dreams as these have been related in all times. The dream of Cæsar's wife, Calpurnia, the night before the assassination (Sueton. *Cæsar*, 81), is such an instance.

There are many dreams recorded both in the Old and the New Testament, which, together with the attendant circumstances, rest on very strong historical evidence, resembling the instances occurring in what is called profane history; and a supernatural agency being admitted in them, there is no reason why it should not exist also in other instances of dreams. For when once we allow the inadequacy of natural means for the explanation of a particular phenomenon, we cannot stop where we please, and say there is a reason why supernatural causes should have operated in this case, but there is none why they should have operated in that. In speaking of supernatural causes or of supernatural agency, phrases to which we attach no definite positive meaning, and which we can only explain negatively, we confess our inability to account for the manner in which an event or events came to pass; and if unable to account for the manner, we cannot take upon ourselves to explain the reason of the occurrence.

The supernatural interpositions to which, in our difficulty, we resort for aid, must, if they exist, be determined by general laws, which in the course of time it either may or may not be given to men to know. At present we see only the particular interpositions, particular events belonging to another system, which we call supernatural, which is governed, however, doubtless, like our own or the natural system, by general laws, and which moves perhaps co-ordinately with this to a common end; and knowing not the laws of that system, nor the connexion between it and our own, we can do no more at present than record the particular instances. It is certainly not philosophical to refer each particular interposition to a particular providence, as is done by Bishop Bull in his sermon concerning the 'Holy Office of Angels;' but in an admission of our own ignorance, combined with an opinion that the interpositions (as they are called) are regulated by general laws, there seems to be nothing to be objected to.

Many dreams which have in former times been accounted supernatural, as revealing facts and truths of science, may doubtless be explained by means within our own knowledge. We have spoken of Franklin's belief in revelations made to him during dreams concerning political events, and have given a natural explanation of their revelations. The dream which is related in Sir Walter Scott's Notes to *The Antiquary* would, there is little doubt, have formerly been considered supernatural.

There are several instances of dreams, similar to those related of himself by Franklin and that related by Sir Walter Scott, given by Henry More in his 'Immortality of the Soul,' (ii. 16,) all of which may be explained similarly; as, for instance, the dream of Avenzoar Albumaron, an Arabian physician, to whom his lately deceased friend suggested in his sleep 'a very soverain medicine for his sore eyes.' Indeed all dreams of the appearance of ghosts, where they are believed to relate what may have been before known to the dreamer, may be explained by the two circumstances, that ideas in dreams are taken for sensations, and that trains of ideas associated together are not liable to be interrupted by sensations, as they are in sleep. Mr. Coleridge has very happily observed that, in the cases where ghosts are believed to appear in dreams, we have the idea of the person to whom the ghost belongs as being in the room in which we ourselves are sleeping; and further, that such ghosts always appear in a half waking state, when 'the impressions of the bed, curtains, room, &c., received by the eyes in the half moments of their opening, blend with, and give vividness and appropriate distance to, the dream image, which returns when they close again.' (*Literary Remains*, vol. i. p. 202.)

There is a long 'Essay on the Phenomenon of Dreaming' in Baxter's 'Inquiry into the Nature of the Human Soul;' the object of which is to prove that dreams are brought about by the agency of spirits. However fanciful is this object, the essay is valuable, as containing many facts and displaying much ingenuity.

The theory of dreams is treated briefly in Dr. Hartley's work, in Mr. Stewart's 'Philosophy of the Human Mind' (vol. i. chap. 8), in which, however, but little is done towards the elucidation of the subject, and in Dr. Beattie's 'Dissertations.' (Lond. 1783, 4to). Dr. Abercrombie's and Mr. Macnish's works are valuable for nothing else than the instances which they furnish. There is an article, occasioned by Mr. Macnish's book, and written by Sir William Molesworth, in the first volume of the 'London Review,' which shows great metaphysical acumen, and from which the reader will derive much instruction.

The works of Aristotle contain a short treatise on dreams (περὶ Ἐνυπνίων); and many valuable observations, as well as fancies, are scattered through the poem of Lucretius. There is also extant, in Greek, a work on dreams by ARTEMIDORUS, besides the Oneirocritikon of Astrampsychus, and that attributed to Nicephorus, a patriarch of Constantinople.

DRENTHE, a small province in the kingdom of Holland, bounded on the north by Groningen, on the east by the kingdom of Hanover, on the south by Overyssel, and on the west by Overyssel and Friesland. Drenthe lies between 52° 35′ and 53° 12′ N. lat., and between 6° 5′ and 7° E. long. Its extreme length from north to south is 41 English miles, and its greatest breadth 39 miles. The soil of the province is in general poor in quality, comprising a large proportion of marsh-land and of sandy wastes. There are only three towns requiring mention, viz.: Assen, the capital, Meppelt, and Koevorden. Assen is about 22 miles south of the town of Groningen; the population in 1814 amounted to 1175 souls, and at present is about 1900. Meppelt, which is in the south-west corner of the province, is more populous, and contains about 5500 inhabitants, many of whom are employed in weaving canvass. Koevorden, situated on the small river Aa, in 52° 41′ N. lat. and 6° 42′ E. long., stands in a morass. It is a place of great strength, being considered the chef-d'œuvre of Coehorn and the key to the provinces of Overyssel, Groningen, and Friesland. It was besieged in 1672 by the bishop of Munster and taken by him through the treachery of the governor, but it was soon after retaken by the Dutch. The population is about 2200. In the statistical publications of the Dutch government Drenthe is for most purposes included with the adjoining province of Groningen, so that not possible to offer any details of that nature. The population of the entire province is about 50,000. [KAMPEN, &c.]

DRESDEN, the capital of the kingdom of Saxony (in the circle of Meissen), is situated on both banks of the Elbe, in 51° 3′ N. lat., and 13° 34′ E. long., at an elevation of about 410 feet above the level of the sea: it is equidistant from Frankfort and Hamburg, Vienna and Munich, Stockholm and St. Petersburg. The fine plain in which it stands is bounded on the east by the eminences which belong to the Saxon Switzerland and are mostly crowned with vineyards and gardens: on the south and south-west there are similar elevations, which are the termination of the Erzgebirge or Ore-mountains of Saxony and Bohemia, on this side. Westward lies the beautiful romantic 'vale of recks,' or 'Plauische Grund,' through which the Weiseritz flows before it traverses part of Dresden and falls into the Elbe. On the north-western side of the city the Elbe winds round an enclosure planted with avenues of trees, and on the north the distance is bounded by a succession of hills, in general covered with firs and pines. Though Dresden does not rank among the largest, it is certainly one of the most agreeable and interesting capitals in Europe, and well deserves the appellation of the 'German Florence.' It is divided into three parts; on the left bank of the Elbe is Dresden Proper, or the 'Altstadt' (Old Town,) with its three suburbs, and the 'Friedrichs-stadt,' which is separated from it by the Weiseritz: these two quarters form by far the larger portion of the city, and are disjoined from the third, or the 'Neustadt' (New Town,) by the Elbe, which is here 480 feet in breadth. In continuation of the New Town, there are some later erections, called the 'Neue Anbau,' or new buildings, which form a kind of suburb to it. The space gained by levelling the fortifications in the years 1810 and 1817 has been appropriated to gardens, promenades, and building.

Dresden contains altogether 11 gates or entrances, 27 public squares, 146 streets, and 20 churches and chapels, viz. 13 for Lutherans, 1 for Reformed Lutherans, and 6 for Roman Catholics; besides 5 synagogues. The population about two hundred years ago was inconsiderable, as the average births from 1617 to 1725 did not exceed 500 yearly: at the close of the eighteenth century however they rose to 1950, but at the commencement of the present fell to [illegible]. After the year 1815 they increased again to 1800, and in 1830 had reached 2000. In 1833-1834 the average of births was 2108, and of deaths 2093. In 1813 the number of inhabitants was 41,218; in 1831 it was 63,979; and at present it is upwards of 66,000. Of this number about 4200 are Roman Catholics, and 800 Jews: the remainder are Protestants. The houses, in number about 3000, are principally built of Pirna freestone, and in general are from five to six stories in height.

The old town, sometimes called Old Dresden, has four squares and 41 streets. The most interesting structure in this quarter is the royal palace, 1300 paces in circuit, which faces the west side of the bridge: it is an irregular building in the Gothic style, embellished with a church, which has the highest tower and steeple in the town. The chief parts of this edifice are the royal audience chamber, the Roman Catholic church, called a chapel, adorned with paintings by Rubens and Mengs, the chamber of ceremony (pracht-zimmer) on the second floor, the porcelain-cabinet, the walls of which are ornamented with porcelain, the Propositions-Saal (hall of propositions), in which the sessions of the Saxon legislature are opened, the royal library, the hall of audience, with a splendid ceiling painted by Sylvester, and the parade-chamber, with paintings by the same master. The celebrated Grüne-Gewölbe (green vault) opens upon the palace-yard, and contains a costly collection of precious stones, pearls, and works of art in gold, silver, amber, and ivory, arranged in eight rooms, the painting of which is green, and the walls are decorated with mirrors laid in compartments of marble and serpentine stone. This collection, which was begun by King Augustus, and has been gradually increased by his successors, is estimated at nearly one million sterling in value. Close to the palace are the chancery building, the depository for the national archives, and the Stallgebäude (mews), in which there are four noble collections in art, namely, the armoury, the gallery of arms, the cabinet of casts and models, and the picture gallery. The armoury contains upwards of 20,000 specimens of armour, weapons, &c., principally from all ages in Saxon and

German history; the gallery of arms, a hall one hundred paces in length, comprises 2000 specimens of antient and modern arms, weapons used in hunting, &c.; the cabinet of casts was formed by Raphael Mengs, purchased by the late king, and enlarged by casts moulded by Bianconi of Rome. The picture gallery, in the upper story of the building, is composed of the outer gallery, which runs round the four sides of the Stallgebäude, the inner gallery towards the yard, and the Pastell-cabinet. The outer gallery contains above 500 paintings of the Flemish school, 90 of the Italian, and many of the French and German: the inner gallery is occupied by 356 specimens of the Italian school; and the Pastell-cabinet comprises 150 paintings of various masters. Near this building stands the Palace of Princes, in which are a handsome chapel, a gallery of portraits of princes of the Saxon and Bavarian lines, a porcelain cabinet, a library of 10,000 volumes, and cabinet of engravings. It is the residence of the co-regent, Prince John. A covered way leads from this palace to the opera-house, where there is space on the stage for 500 performers, and in the house itself for 8000 spectators. The square adjoining it is called the Zwinger; three sides of it are occupied by six pavilions connected by a gallery one story high; the quadrangle contains four fountains and three hundred orange trees. The six pavilions, which are profusely ornamented, contain a museum of natural history, consisting of four galleries and six saloons; a cabinet of engravings, comprising 200,000 plates and upwards, arranged in twelve classes; a collection of mathematical and philosophical instruments; a collection of works of art in ivory, alabaster, silver, iron, wood, &c.; a chamber of models useful in hydrography, mining, military architecture, &c.; and a miscellaneous cabinet.

The other buildings of note in the Old Town are the Brühl Palace, at present the residence of one of the royal family. It is the principal depository for the Meissen china; and behind it are spacious gardens and grounds, commanding delightful views of the banks of the Elbe and the surrounding scenery. Immediately adjacent are the hall, in which there is an annual exhibition of the productions of Saxon artists; the Academy of Arts and School of Design, and the Gallery of Duplicates, in which there are 250 paintings for which there was not sufficient room in the Great Gallery, and the celebrated tapestries worked after Raphael's designs. On one side of the square of St. Mary's church is the Mint; and adjoining it is the Arsenal, which contains a valuable collection of every kind of arms, and in one of the apartments, the portraits of all the Saxon sovereigns from Maurice to the present times. Facing the Arsenal stands the Academical Building, now used for a medical and surgical school; below it there is a subterraneous hall decorated with paintings by Francisco Casanova. In the Pirna Street is the House of Assembly, a building of two stories, where the states hold their sittings and committees. The only handsome square in the Old Town is the Old Market Place, of which the town-hall is the great ornament. In this direction lie also the royal mansion and garden, now a botanical garden, New Post-Office, Kaufhalle (Trades' Hall), with its colonnade, Treasury, German theatre, two royal villas, with fine gardens and chapels, the Observatory and grounds attached, the Mews and Riding School, Military Hospital and gardens, and the Orphan Asylum and church. The most remarkable churches in the Old Town are, St. Mary's, built in 1726, after the model of St. Peter's at Rome; the Church of the Cross, a parallelogram, with a steeple 305 feet in height containing three tiers of columns; the Protestant church of St. Sophia, an irregular structure erected in 1351; and the Roman Catholic chapel or church of the court, begun in 1751 by Gaetano Chiavero, on which more than 30,000*l.* have been expended. This chapel is connected with the royal palace, has two side churches, and a pyramidically disposed steeple, with three tiers of columns, in all 302 feet high, and contains the vaults for the royal family, besides a multitude of paintings, statues, monuments, carvings, altars, &c.

Three suburbs are connected with the Old Town by means of as many avenues; the Pirna, See or Dohna, and Wildsruf suburbs. The first of these, which extends from the banks of the Elbe to the Kaidiz brook, has a long street, in which is the palace where the present king usually resides, with delightful grounds attached to it. The Botanical Garden, belonging to the Medical School, is close adjoining; and likewise Maurice's Avenue, on part of the site of the former fortifications: this avenue derives its name from a piece of sculpture in stone, nearly three centuries old, exhibiting Maurice, the elector, and Augustus, his successor, with their consorts, as large as life; Maurice being represented as threatened by the scythe of death, and delivering his electoral sword to Augustus. In front of the external entrance into the Pirna suburb is the Great Garden, which is nearly five miles in circuit; and to the right lies the Nursery of Fruit Trees, which contains upwards of 65,000 plants, and a building in the centre, where concerts are held every week. The See suburb covers the south-west, and the Wildsruf the western side of the Old Town. From the last-mentioned suburb is an avenue called the Ostra-Allee, on one side of which are Prince Maximilian's palace, gardens, and observatory, and the buildings where the silver bullion is pressed, cut, and prepared for use at the Mint: this avenue opens upon a massive bridge across the Weiseritz, which leads to the Friedrichs-stadt (Fredericstown or Neu-Ostra), the second grand quarter of Dresden, between which and the Elbe are the wooded grounds, called the Ostra-Gehege. Here are the cemetery and infirmary for Roman Catholics, in which is Balth; Permoser's monument to his own memory, chiselled by himself, and representing the Descent from the Cross; the Marcolini Palace and grounds, with an observatory, chapel, and collection of engravings, and drawings in sepia by Seidelmann, and in the grounds Mutielli's fine marble group of Neptune, drawn by sea-horses, and attended by marine deities and tritons, in the act of crowning Amphitrite with a wreath, the group serving as the channel for a cascade; the Freemason's Lodge; and a riding-house. This part of Dresden is inhabited almost entirely by mechanics and others of the lower classes.

The access from the old town to the new town, the third grand quarter of the city, which lies to the north east on the right bank of the Elbe, is across the palace square and celebrated stone bridge, called the Bridge of the Elbe, from its being the largest and handsomest structure of the kind which traverses that river. It is also denominated Augustus's Bridge, in honour of Augustus II., its founder. It is the work of Pöpelmann, rests on sixteen arches, is 1420 feet long and 36 broad, and was completed in the year 1731. The fourth pier, which was blown up by Marshal Davoust in 1813, was restored by the Russians in the following year. A cast-metal gilt crucifix, resting on a gilt copper globe placed on a mass of rustic stone about 28 feet in height stands upon the fifth pier. The bridge opens, on the new town side, upon an inclosed space, planted with linden-trees, 400 paces in length and 20 in breadth, and embellished with an equestrian statue of Augustus II., arrayed in the imperial costume of antient Rome, with a modern wig and field-marshal's baton, the work of Wiedemann, a coppersmith of Augsburg, and erected in 1723. A broad street, lined with linden-trees runs from the bridge to the northern extremity of the new town; on the western side of it is the Japanese Palace, and parade in front, and on the eastern a range of barracks for the cavalry and infantry, for 2300 officers and men, besides horses. The palace, now called the Augusteum, has this inscription in front, 'Museum usui publico patens,' and is the depository of four choice collections:—The Cabinet of Antiquities, founded in 1725, and arranged in 12 spacious and well-lighted rooms on the ground-flour, which contains some splendid statues and other remains of antient art; the Cabinet of Coins, founded in 1716, also on the ground-floor, and particularly rich in the coins of Saxony, as well as remarkable for a fine series of medals struck in honour of illustrious individuals of all countries; the Cabinet of Porcelain, displayed in 18 rooms, also on the ground-floor, and containing a rare and extensive collection of china, of Indian, Chinese, Japanese, Meissen, Sévres, &c. manufacture, besides specimens of Florentine and Roman mosaic work, Chinese decorations, Saxon works in marble, &c.; and the Royal Public Library, deposited in three saloons and 21 apartments in the first and second stories, and consisting of more than 220,000 volumes, 2700 MSS., above 150,000 pamphlets, and 20,000 maps. Among these are upwards of 1600 printed books of the fifteenth century. The new town also contains the Church of the Trinity; a Town-hall; the Cadet Academy; Engineers' School, and Academy for artillery cadets; and the commandant's residence and main guard. It has 22 streets in all. To the north-east of the new town lies what is called the Neue Anbau (new buildings), a part of the town once an unproductive waste, and first laid out as gardens by some Bohemian gardeners, who settled here in 1730, but the site of which is becoming gradually occupied by handsome residences. It contains a playhouse and baths, a house of industry, schools for the indigent and for the garrison of Dresden, and a spacious cemetery. The house for the reception of bodies of unknown persons has been lately decorated with the Dance of Death, a rude sculpture in stone containing 24 figures.

In the list of public establishments not hitherto noticed are a High School (the Kreutz-schule,) conducted by 12 masters, and attended by about 400 pupils; two schools for teachers, in which the deaf and dumb are taught; 23 free and elementary schools for about 3000 Protestant children; an asylum for the reformation of depraved children; three infant schools; several public schools for the children of the townsmen; the Schmalz foundation for educating poor children; and a public school for girls. Dresden contains altogether 71 establishments for Protestant education. The Catholics have a High School, the Josephina Foundation, for the education of the superior class of females, two ordinary schools, a free school, and a school for educating 12 soldiers' children, attached to the latter. To these should be added the Free Masons' School (with about 100 children) and a Veterinary School. The number of institutions for the sick and maimed and orphans is eight, including three hospitals. There are a variety of learned and other societies, the chief of which are the Academy of Arts, the Society of Economy, which promotes the various interests connected with Saxon industry, the Mineralogical, the Natural History and Medical, the Bible, the Missionary, and the Saxon Antiquities Societies. The number of benevolent institutions and societies of all descriptions is 78.

Dresden has no external trade or manufactures of much importance. It is a place of transit for colonial and other foreign produce from Magdeburg, Hamburg, &c., and has five general fairs, besides a yearly fair in June, at which a considerable quantity of wool is sold. Its mechanics have obtained some note in Germany for the manufacture of mathematical, mechanical, and musical instruments, engraving on steel and stone, the making of gloves, carpets, turnery ware, jewellery, straw hats, painters' colours, &c. These mechanics are incorporated into 60 fraternities. Morocco and other leather, refined sugar, tobacco, white lead, tin ware, glass, stockings, cotton goods, &c. are also manufactured, but not on an extensive scale. There is a foundry for bomb-shells and cannon, and a yearly exhibition of Saxon manufactures. The municipal expenses of the town are about 49,000 dollars (6900*l.*) a year.

The immediate vicinity of Dresden abounds in places of public resort, and its environs are full of attractions for strangers, among which we may notice the villages of Lochwitz, Kreischa, and Dohna, the scenery called the Schlottwitzer, and Plauische Grund, the antient burg of Tharant, the vale of Seifersdorf, the Saxon Switzerland, Pillnitz, with its summer palace, and the village of Schandau.

DREUX, a town in France, the chief place of an arrondissement in the department of Eure et Loir. It is on the river Blaise, a tributary of the Eure, 41 miles from Paris, in a straight line west by south, or 50 miles by the road through Versailles and Houdan; in 48° 43′ N. lat., and 1° 21′ E. long. It is on the great western road to Alençon, Laval, Rennes, St. Brieuc, and Brest.

Dreux was known under the Romans by the name *Durocassæ*, and appears to have been included in the territories of the Carnutes. From Durocasses the name was *contracted into Droca*, from which the modern form Dreux *is derived.* The town with the surrounding district, forming the county of Dreux, was included in the acquisitions made by the Northmen or Normans in France, but was early taken from them, and became part of the domain of the French crown. It continued, after several changes, to be held by a younger branch of the Bourbon family up to the breaking out of the French Revolution. In December, 1562, a severe action was fought in the plain of Dreux, between the rivers Eure and Blaise, between the royal Catholic army under the Constable Montmorency and the army of the Huguenots under the prince of Condé and the Admiral Coligny. The Huguenots were defeated, and the prince of Condé taken prisoner. In A.D. 1593, Dreux, which was in [illegible] possession of the party of the League, was taken by [illegible] after an obstinate resistance of 15 or 18 days.

[illegible] which is a pleasant country, is traversed by the Blaise. On a hill which commands the town are the remains of the antient castle of the counts of Dreux: in the midst of these ruins rises the new chapel built on the site of a former collegiate church by the late duchess dowager of Orléans. The houses of the town are partly of brick, partly of wood, and partly of plaster: there is a small promenade, an alley of trees planted along the river, and called Boulevart. The town-hall is a Gothic building; and there is, beside the chapel mentioned above, a parish church, also Gothic: before the Revolution there were two parish churches. The population, in 1832, was 5166 for the town, or 6249 for the whole commune. The inhabitants manufacture serges, blankets, hosiery, and other woollen goods, hats, and leather: there are tan-mills and dye-houses: beside the articles which they manufacture, they carry on trade in sheep and cattle. There are three fairs in the year. There is a good hospital and a high school. The arrondissement of Dreux had, in 1832, a population of 70,532.

DRIFFIELD. [Yorkshire.]

DRILL, the course of instruction in which the soldier is taught the use of arms and the practice of military evolutions.

DRILL HUSBANDRY. [Drilling.]

DRILLING is a mode of sowing by which the seed is deposited in regular equidistant rows, at such a depth as each kind requires for its most perfect vegetation. It has been practised by gardeners from time immemorial, and from the garden it has gradually extended to the field. In those countries where maize or Indian corn is extensively cultivated the seed is always deposited in rows; and during the growth of the plants the soil in the intervals is repeatedly hoed and stirred to a considerable depth, as is likewise the practice in vineyards. This cultivation not only keeps the land free from weeds, but by allowing the dews and the influence of the atmosphere to penetrate into the earth, greatly encourages the vegetation and growth of the plants.

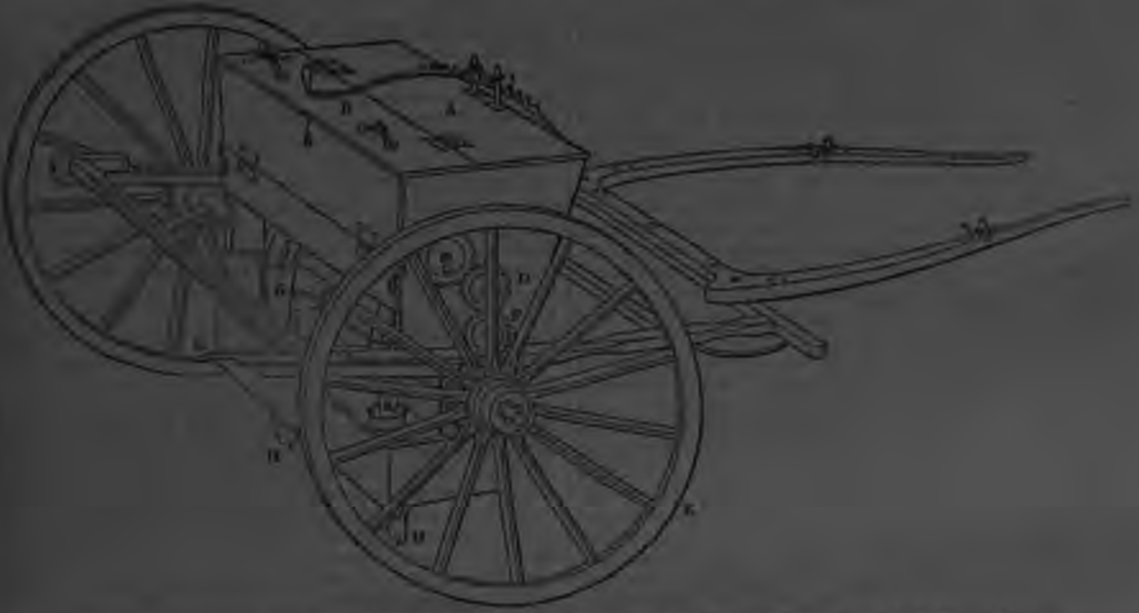
It was no doubt from observing the effect produced by stirring the soil that Jethro Tull and his followers adopted the theory, that finely-divided earth formed the chief food of plants; and this led to the adoption of the row culture for every species of plant, and horse-hoeing the intervals, from which the practice obtained the name of the horse-hoeing husbandry. This was at one time thought so important a discovery as to be called the new husbandry, which was expected by its most zealous supporters entirely to supersede the old methods.

The system of Tull has been long proved to have been founded on erroneous principles. Tull himself was ruined by his experiment; and his warmest admirers, Du Hamel, Du Monceau, and De Châteauvieu, were forced to admit its fallacy, after having suffered considerable loss by adopting its practice. But the advantage of sowing the seed in rows or drills has stood the test of experience; and the drill husbandry, by combining the advantages of continued tillage with those of manure and a judicious rotation of crops, is a decided improvement on the old methods of sowing the seeds broad-cast. The crops which are now most generally drilled are potatoes, turnips, beans, peas, beet-root, cole-seed, and carrots; and in general all plants which require room to spread, whether above or under the ground. The distance between the rows in these crops is generally so as to allow the use of a light plough or horse-hoe to be drawn by a horse between them without endangering the growing plants. The most common distance is twenty-seven inches, where the row culture is practised in its greatest perfection, which is in the north of England and in Scotland. The Northumberland mode of cultivating turnips, which is adopted by most scientific farmers, and seems to have decided advantages, consists in placing the manure in rows immediately under the line in which the seed is to be drilled, and keeping the intervals in a mellow and pulverized state by repeated stirring. In this mode of sowing the seeds vegetate more rapidly, and are sooner out of danger from the fly, and the crop is more certain as well as heavier. Should the turnips fail, which with every precaution will sometimes happen, the land has had the benefit of a complete fallow, and is well prepared for any other crop.

The instrument used for sowing turnips and other seeds in single rows is sometimes a small light wheel-barrow, which a man pushes before him; hence called a drill-barrow. It has a box in which the seed is put, with a slide to regulate the cavity. This is allowed to fall on a wooden or metal cylinder below. In the circumference of this cylinder are several cavities where the seed lodges, and is carried down into a tin funnel below; the remainder is prevented from falling through by small brushes in which the cylinder turns. The motion is communicated from the wheel which runs on the ground to the cylinder by means of a chain on two pulleys placed on the axes of the wheel and cylinder.

The improved Northumberland drill, of which a figure is annexed, is a more perfect as well as more complicated instrument. It is supported on two wheels, and drawn by a horse. It sows ground bones, ashes, rape cake, or any other dry manure at the same time with the seed. The body of the drill consists of two boxes, A and B, divided by a partition between them, and each again divided into two by another partition at right angles to the first. In the box A is put the manure, in B the seed. Two slides are fixed in each compartment to regulate the supply of seed or manure. In the lower part of the boxes, and just before the opening which is regulated by the slides, are two cylinders, one for the box A and another for B. On the cylinder in A are fixed shallow cups with short stems, which dip in the bones and carry a certain quantity over the cylinder as it turns, which falling in the funnels K K is deposited in the furrows made by the coulters H H. The cylinder in the box B has projecting pieces of iron, with a small cavity in each near the end, which takes up a very small quantity of seed, and discharges it in the same manner into the two funnels K K. On the axis of the wheel E is a toothed wheel, which turns a small wheel D on the axis of the cylinder in A, and this turns another wheel D on the axis of the cylinder in B. As these two wheels move towards each other, the two cylinders turn in contrary directions, which is a convenience in throwing the seed and the manure into the funnels K K at the same time. The wheel E may be lifted up by means of a lever G, and then the cylinders do not revolve. There are various other contrivances which cannot well be explained without a more detailed figure of the different parts.

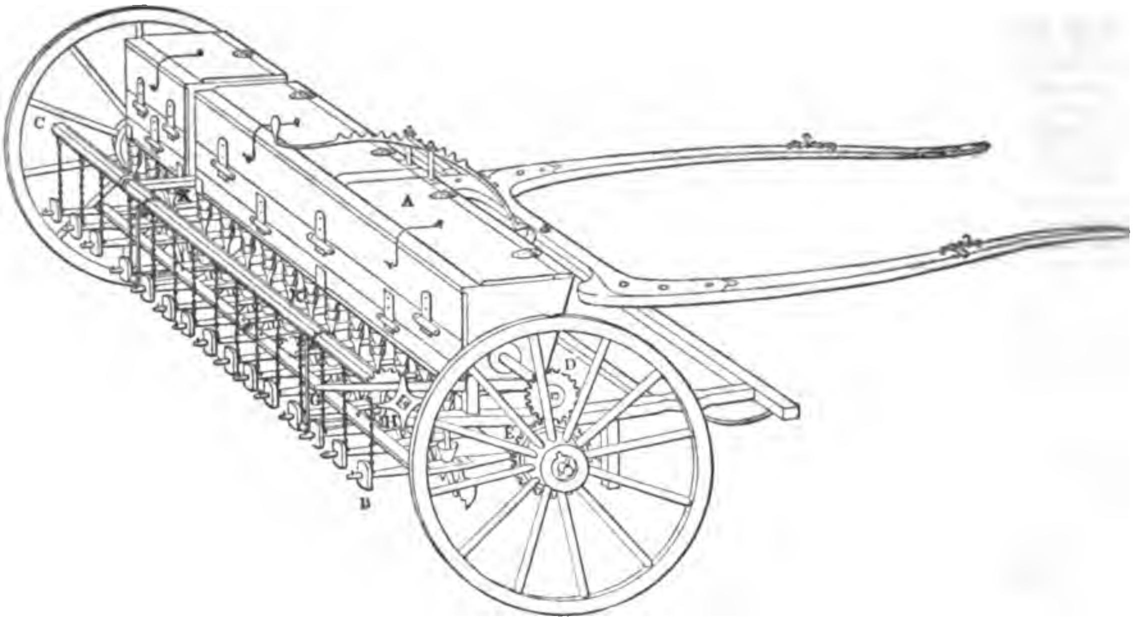
In some districts there is still a prejudice against the use of the drill even for turnips. In Norfolk, where the corn is usually drilled, the turnips are still very generally sown broad-cast. The cause of this appears to be, that as the cultivation of turnips was first introduced from Flanders into Norfolk, and in Flanders turnips are never drilled, because there they are generally sown as a second crop immediately after rye harvest, they have continued the old method first introduced, and the labourers are become very skilful in setting out the plants at proper distances with the hand-hoe. In the north they were introduced at a later date, and the improved mode of sowing in rows was immediately adopted. The Norfolk farmer asserts that the barley, usually sown after turnips, is better when the manure has been equally distributed than when it lies in rows, as the land is only slightly ploughed after sheep have been folded on the turnips, and the manure remains in stripes. On the whole, however, drilling in the Northumberland method seems to be the best practice, and is adopted very generally by all scientific farmers.



Northumberland Turnip Drill, drawn from one manufactured by Messrs. Cottam and Hallen, Winsley Street, Oxford Street, London.

On light friable soils, drilling the seed is very generally adopted. There is a neatness in the appearance which recommends it to the eye, and machines have been so improved, that the seed is sown more regularly and is better covered than it could possibly be by the best broad-cast sower followed by the harrows. In very stiff heavy soils, and in moist seasons, it is not so practicable to use the drill. It is sometimes impossible to get the land sufficiently dry and pulverized to allow of drilling to advantage; and when the land is wet the tread of the horses would greatly injure it. If our clay soils were more generally underdrained, and the subsoil plough were used to loosen them to a considerable depth, they might be rendered so dry and friable that the drill could be used at all times.

In poor sandy and gravelly soils where bones have been found of so great advantage as a manure, drilling is the only mode by which the bones and the seed can be sown in contact with each other; an important circumstance. When the ground has been well prepared and laid into stitches of a convenient width, a whole stitch may be drilled at once, with so much regularity, that an instrument with as many hoes as there are drills, and of the same width, may be drawn over the land to stir all the intervals, without danger of injuring the plants. This requires great practice and attention; but it may be considered as the perfection of the drill system. Where drilling seed is generally adopted, and the farms are not so large as to make it prudent for the occupier to purchase expensive instruments, drilling is become a separate profession. An industrious man with a small capital buys improved drills, and undertakes to drill the seed at a certain price per acre. The farmer finds horses and seed, and the driller finds the machine, and attends to the management of it himself. By constantly doing the same thing he becomes very expert; and in a neighbourhood where there are many small occupiers, a good drilling-machine, which costs from 30*l.* to 50*l.*, procures the owner a very good livelihood during the whole season of sowing; and if the instruments for hoeing were more generally used, the profession of a hoer of land might be advantageously united to that of the driller. Corn is generally drilled at the distance of eight or nine inches; and a machine which drills twelve rows will cover a stitch ten feet wide. Some prefer the rows to be nearer, but in that case the hoeing is not so easily performed with a machine, and it is done by hand. The most improved machine for drilling is Cook's patent lever drill, which sows



Cook's, or Suffolk Patent Drill, drawn from one manufactured by Messrs. Cottam and Hallen, Winsley Street, Oxford Street, London.

from ten to fifteen rows at once. The description of the Northumberland turnip-drill will make the construction of Cook's drill more easily understood. In the annexed figure the box for sowing manure is not added, as it is in the Northumberland drill. The drill is supported on a frame and two wheels. The box A, which holds the seed, lets it down gradually into a lower part, in which the cylinder, which has the small cups fixed to its circumference, is turned by the wheel D. By means of the lever G this may be raised so that its teeth are freed from those of the wheel E, and the motion of the cylinder is stopped. The coulters which make the drills are each fixed to a lever, at one end of which, B, a weight is fixed to press the coulter into the ground. Each coulter has a separate lever, so that it adapts itself to all the inequalities of the soil. A chain proceeds from the end of each, and may be wound round a cylinder C by turning the handles fixed to it at H, where there is also a racket-wheel to prevent its unwinding. The intent of this is to raise all the coulters out of the ground, when the drill is not intended to act, or is moved from place to place. When the drill is used, the box A is filled with seed, and the slide in it so adjusted as to supply it regularly; the lever G, which was fixed down, is raised, and the wheel D connected with the wheel E. As the horses proceed, the cylinder turns, the cups take up the seed, and throw it into the funnels K K, which conduct it to the drill behind the coulter. A light harrow, or a bush-harrow, follows, which covers the seed. In very loose soils the roller completes the operation.

DRIMYS. [Canella Alba; Wintera.]

DRIN, or DRINO. [Albania.]

DROGHEDA is a seaport town, forming with its liberties the county of the town of Drogheda, in the province of Leinster in Ireland, situated between the counties of Meath and Louth, upon both sides of the river Boyne, about four miles from its entrance into the Irish channel, and 23¼ Irish or 29½ English miles from Dublin.

The town and liberties occupy the parish of St. Mary's, towards Meath, on the south side of the river, and the parish of St. Peter's, and part of the parish of Ballymakenny, towards Louth, on the north side of the river. The total area of the town and liberties is 5802 statute acres. The recent boundary act has not made any alteration in these limits.

The name Drogheda, of which Tredagh (as it is generally written in old books) is a corruption, signifies the bridge of the ford. A synod was held here by Cardinal Paparo, the Pope's legate, in 1152; which was very numerously attended by the Irish ecclesiastics, and at which the authority and power of the church of Rome were greatly augmented in Ireland. After the conquest, the first care of the English seemed to have been the erection of a substantial bridge, as appears by a grant of pontage made in 1228 by Henry III., who in the same year also divided the town into two parts, viz., Drogheda versus Uriel, on the Louth side of the river, and Drogheda versus Midiam, on the Meath side. In 1412, the division of the town into two corporations being found productive of much animosity between the inhabitants of the opposite sides of the river, was repealed by Henry IV., since which time *Drogheda* on both sides of the Boyne has continued to be one body corporate. Being a frontier town of the pale, Drogheda was a principal rendezvous for the forces which were so frequently required in Ulster between the fourteenth and seventeenth centuries; and many of the Irish parliaments were held here, particularly during the fifteenth century. In the parliament which met at Drogheda in 1494 was passed the statute called Poyning's Act, which made it necessary to the validity of all future acts of the Irish parliament that the bills should first be certified as fit for the consideration of that assembly by the king in council (10 Hen. vii. c. [illegible]). By this act the freedom of the Irish legislature was virtually destroyed, and in this state of subjection it continued until the assertion of independence by the Irish volunteers in 1782.

A mint was at this time established at Drogheda, and the town appears to have been a place of much greater importance than at any subsequent period.

On the breaking out of the rebellion of 1641, Drogheda was besieged by Sir Phelim O'Neill, and a large force of Irish, who invested the town on both sides on the 1st of December. The garrison consisted of only about 1000 men, under Sir Henry Tichborne and the Lord Moore, who having taken an oath to defend the place to the last extremity, not only repulsed several attacks of the Irish, but succeeded in capturing large booties and doing great damage to the rebels in numerous sallies, until the 28th of February, when they finally forced them to raise the siege.

On the arrival of Cromwell in Ireland in 1649, the Marquis of Ormond placed a garrison of nearly 3000 men in Drogheda, under the command of Sir Arthur Aston; and satisfied of its security, withdrew into the midland counties to recruit. Cromwell left Dublin on the 30th of August, and came before Drogheda on the 2nd of September, but, owing to some delay in the arrival of his artillery, which he had sent round by sea, he did not open any battery till the [illegible] On the 10th, at 5 o'clock in the afternoon, having effected a breach, without the delay of making regular approaches, he gave the assault; and although twice repulsed, succeeded on the third attempt, which he led himself, in carrying the town. Quarter was promised by his officers and men, and the bulk of the garrison are said to have laid down their arms on that assurance: nevertheless they were all put to the sword, with the exception of a very few who escaped by the north gate, and about thirty whom Cromwell after wards transported to Barbadoes. Drogheda was last held for the Roman Catholic party by the Lord Iveagh, with a garrison of 1000 men, in 1690, but it surrendered to a detachment of King William's army the day after the battle of the Boyne. [Boyne.]

The old walls and four gates were standing within the last fifty years. A few buttresses and St. Laurence's gate are all that now remain. The last is a striking object, and is in good preservation. Drogheda is rich in ecclesiastical antiquities. The Dominican Friary on the north part of the town was founded by Lucas de Netterville, archbishop of Armagh, in 1224, and is celebrated as the scene of the submission of four Irish princes to Richard II. in 1394. A lofty tower of this friary, called the Magdalen Tower, is still standing, together with some of the cloisters. The ruins of the Carmelite Friary, founded in 1240, on the south side of the river, are still to be seen on the right hand of the great northern road coming from Dublin. The present parish church of St. Mary's is partly built on these ruins. The Franciscan Friary on the north-east of the town is standing, although much ruined, and forms a striking feature in the view of Drogheda from the approaches on the Dublin side. A gable and bell-tower, with part of the aisle, of the Priory of Canons Regular also remain on the west of the town near the river; and there are some traces of the Priory of St. Laurence near the gate, and of the Hospital of St. Mary, beyond the Canons Regular. Besides these, there was an Augustinian Priory, founded before the coming of the English, of which no trace now remains; as also the Priory of St. John, and the religious houses of St. James and St. Bennet. The possessions of the Augustinians and Carmelites, as also of the Priory of St. Laurence and the house of the blessed Mary de Urso, came into the hands of the corporation by charter of 3 and 4 Philip and Mary, A.D. 1557.

Drogheda is governed by a corporation, consisting of mayor, sheriffs, 24 aldermen, and an unlimited number of freemen. This body is nearly self-elected, and has uniformly acted on the principle of excluding Roman Catholics. They hold their authority under numerous charters, from the 12th of Henry III. to the 3rd of William IV. Assizes for the county of the town are held here twice a year before the mayor and the judges of assize. Drogheda is the first town on the north-east circuit. A civil bill court is also held here twice a year before the assistant barrister of the county of Louth. Petty sessions are held once a fortnight. The gaol of the county of the town, on the road to Tirfecan, was lately built by grand jury presentment, and is in good condition, though sometimes deficient in accommodation. Drogheda is watched and lighted by rates imposed under acts of parliament. The expenses of paving, within the walls, are defrayed by the corporation: the roads and streets without the walls are repaired by grand jury presentments. The expense of watching in 1833 was 310*l.* 10*s.* 7*d.*; of lighting, 320*l.*; of paving within the walls, 213*l.* 13*s.*; and of repairing roads, &c. without the walls, 135*l.* 6*s.* 5½*d.* Drogheda returns one member to the Imperial Parliament.

The port and harbour are under the direction of harbour commissioners, constituted by 3 Geo. III. c. 39, and 7 and 8 Geo. III. c. 35. These and the corporate authorities under whose control the harbour was formerly, have received from time to time a sum of 6000*l.* for the improvement of the quays and river. Their receipts in tonnage dues for 1834 amounted to 11,668*l.*, and in 1835 to 5829*l.* Vessels of 250 tons come up to the bridge, and the channel of the Boyne is capable of great improvement. The amount of postage collected at Drogheda in each year from 1833 to 1836 was as follows:—1833, 1935*l.* 14*s.* 3*d.*; 1834, 2040*l.* 15*s.* 5*d.*; 1835, 2057*l.* 18*s.* 5*d.*; 1836, 2244*l.* 7*s.* 1*d.*

The increase under this head shows that the trade of the town is reviving.

This corporation is subject to the 'New Rules' of the 25th of Charles II. [Corporations of Ireland.] Their estates consist of 2032 acres, besides houses and tenements, producing an average annual revenue of 4500*l.* It is estimated that these estates, if out of lease, would now let for 12,000*l.* per annum. They are principally tenanted by members of the corporation, who, up to 1833, were alone permitted to become tenants, and who still enjoy peculiar advantages in renewing their leases.

Drogheda is a compact and well-built town; but the miserable suburbs extending north and south greatly disfigure the approaches. The chief part of the town lies on the northern side of the river, which is the higher ground. The principal street runs nearly north and south, and forms a portion of the great northern road. Other good streets branch east and west. About the centre of the town, on the western side of the main street, stands the town-house, a handsome building with a clock and cupola; and north of this, on the opposite side of the main street, is the parish church of St. Peter, a respectable edifice of cut stone, with a spire designed by Johnston. The Roman Catholic chapel of St. Peter is capacious and well-built; and there is a handsome Presbyterian meeting-house, and a Methodist chapel of chaste architecture. Besides these there are four other Roman Catholic chapels, and two nunneries; one of the latter, called the Sienna Nunnery, near the site of the Franciscan Priory, is a large establishment. There are two barracks.

There is a considerable import of coal from Workington and Whitehaven. It sells at from 12*s.* to 14*s.* per ton; but even this low price precludes the purchase of coal by the poorer classes, who in many instances burn little else than weeds and brambles.

The linen manufacture, about twenty years ago, was the staple trade of Drogheda. The articles manufactured were dowlas, sheetings, and a narrow web called market linen. The number of weavers in the county of the town at that time was about 2000. The quantity of linen sealed in the Drogheda market in 1820 was 53,697 pieces; and in 1821, 61,866 pieces: the average of the years from 1830 to 1834 (both included) was only 19,495 pieces. The number of looms now employed in Drogheda and the country around does not amount to 1000; the number of weavers at present (1837) employed in the town is not much more than 200; and the wages they earn rarely amount to 5*s.* per week. The lower class of the population are miserably poor; and as numerous vagrants pass through the town to and from Dublin, the streets are constantly filled with beggars, who collect in crowds round the different stage-coaches when changing horses, and seriously annoy travellers upon the northern road. A mendicity institution was established in Drogheda in 1821 the corporation give a house rent free, and the establishment is supported by voluntary contributions. The expenditure from the 1st May, 1831, to the 25th June, 1833, was 812*l.* 8*s.* 2*d.*; and the receipts were 786*l.* 2*s.* 2*d.* There is also an almshouse, with a rental of 241*l.* 12*s.* 6*d.*; and an hospital for the county of the town, constituted under the provisions of 47th Geo. III. c. 50, which receives 90 in-door patients, and gives dispensary relief to about 4000 poor annually. It is supported by a grant of 50*l.* per annum from the corporation, by voluntary contributions, and grand jury presentments: total receipts for 1833, 364*l.* 10*s.* 3½*d.* There is a savings bank in the town, the deposits in which are increasing. The total number of depositors in 1835 was 671; gross amount of lodgments 17,729*l.* 19*s.* 7½*d.*

There has been little or no increase in the population of Drogheda since the year 1798, when the lists which the inhabitants were obliged to put up on their doors gave a population of about 17,000. In 1821 the numbers were, males, 8702; females, 9416; total, 18,118: and in 1831 the numbers were, males, 8178; females, 9187; total, 17,365 showing a considerable decrease, which has been attributed partly to the emigration of decayed weavers, and partly to the mortality caused by the cholera, which, since 1831, is estimated to have carried off upwards of 1500 inhabitants. In the latter year, the number of males upwards of twenty years of age returned as employed in manufactures, or in making manufacturing machinery, was 946; of whom 153 are stated to be employed in the linen manufacture, 788 (not accurately classed) in the cotton and linen manufacture, and 5 in the manufacture of tobacco.

In 1821 there were in the county of the town of Drogheda 1147 young persons receiving daily instruction, and in 1834 the numbers were—

Parish.	Schools.	Males.	Females.	Total.
St. Mary's . .	1	56	16	72
St. Peter's . .	11	458	552	1010
Ballymakenny .	1	45	12	57
		559	580	1139

Of these schools three are in connexion with the National Board; and one, upon Erasmus Smith's foundation, has an income of 280*l.* per annum. The statute 5 Ed. IV. c. 46 grants a university to Drogheda; but the provisions of the act have never been carried into effect.

The town expenses are defrayed by grand jury assessments. The total sum so levied in 1833 was 1863*l.* 14*s.* 3½*d.* An obscure work, entitled 'A History of Drogheda,' was published some time ago in this town; but as yet this part of Ireland has not been made the subject of adequate historical illustration.

(Cox's *History of Ireland;* Temple's *History of the Ex. Irish Rebellion;* Bernard's *History of the Siege of Drogheda; Parliamentary Papers, &c.*)

DROHOBYCZ or **DROHOVITSCH**, a royal town in the circle of Sambor, in the Austrian kingdom of Galicia, situated on the Tyszmanika, a tributary of the Dniester. It lies in 49° 22′ N. lat., and 23° 35′ E. long. A great portion of the houses are filthy cabins, without chimneys, constructed of boards. The town however has several buildings of consequence, among which are the high-church, a fine structure of the Gothic order, a Basilian monastery, with a grammar-school conducted by the brotherhood, a chapter-house, several churches, a synagogue, castle, and seminary for teachers. The town, with its eight suburbs, contains about 1200 houses, and 7250 inhabitants. The royal salt works, including the adjacent works at Mobrzyc, Solec, and Stebnik, produce about 3700 tons annually, which are extracted from salt rocks and saline clay. There is a brisk trade in native and foreign produce, particularly wine, linens, cottons, leather, and grocery, which is mainly carried on by the Jews, who form full seven-eighths of the population; and the corn and cattle markets bring much profit to the place.

DROITS OF ADMIRALTY are the perquisites attached to the office of Admiral of England (or Lord High Admiral), and belonging, when that office is vacant, to the crown. Of these perquisites the most valuable is the right to the property of an enemy seized on the breaking out of hostilities. Large sums were obtained by the crown on various occasions in the course of the last war from the seizure of the enemy's property, most of which however was eventually given up to the public service. By the last arrangement of the civil list (1 Will. IV. cap. 25), whatever Droits of Admiralty may accrue during the present reign are to be paid into the Exchequer for the use of the public. The Lord High Admiral's right to the tenth part of the property captured on the seas has been by statute relinquished in favour of the captors.

DROITWICH. [WORCESTERSHIRE.]

DROME, a river in France, belonging to the basin of the Rhône. [DRÔME.]

DROME, a department in the south of France, bounded on the north and north-east by the department of Isère, on the east by the department of Hautes Alpes; on the south-east by the department of Basses Alpes, and on the south by the department of Vaucluse: on the whole of the west side it is bounded by the river Rhône, by which it is separated from the department of Ardèche. The form of the department is irregular: its greatest length is from north-north-west near the village of St. Rambert, on the Rhône, to south-south-east, near the village of Ferrassières de Montbrun, 88 or 90 miles; its greatest breadth, at right angles to the length, is from Pierre-latte, on the Rhône, to the neighbourhood of Lussettes, on the Buech, 60 miles. It is comprehended between 44° 6′ and 45° 20′ N. lat., and 4° 36′ and 5° 45′ E. long. The area is given by M. Malte Brun at 336 square geographical leagues, or 2570 square miles: about the area of the English county of Devon. The population in 1832 amounted to 299,556, about three fifths of the population of Devonshire. The area of the department is above the average of France, but the absolute and relative population (117 to a square mile) are both considerably below the average. Valence, the capital, is on the Rhône, 295 or 296 miles south-south-east of Paris, in a straight line, or 352 miles by the road through Melun, Auxerre, and Lyon.

The eastern side of the department is mountainous, being occupied by the branches sent off from the mass of the Alps. This mountainous tract occupies two-thirds of the department. The mountains are for the most part calcareous or argillaceous: the highest, which are on or near the eastern boundary of the department, have an elevation of about 5500 feet: they become lower toward the west and gradually subside into the valley of the Rhône. Of the mountains, the Inaccessible Mountain and Mount Devez, are reckoned among the curiosities of this part of the country. The Inaccessible Mountain is remarkable for its form, being in one part narrower at the base than at the summit, which gives it the appearance of an inverted pyramid: the Mount Devez is considered to be the cause of a healthy breeze which pervades the territory of Nyons; it is said to be occasioned by the condensation of the vapours from the neighbouring mountains, which are, for a part of the year, covered with snow. The mountainous tract is intersected by valleys, communicating with each other by narrow and dangerous bye-roads, and watered by streams, which, when swollen by the melting of the snow, overflow their banks and occasion great devastations. The rivers are numerous, but none of them are very considerable.

The Rhône bounds the department on the western side for a distance of seventy miles, for the greater part of which its channel is full of small islands. It carries off the drainage of the whole department: its tributaries rise in the mountains of the eastern district, and flow westward into the main channel. The valley of the Rhône contains the most condensed population, and several of the principal towns are on its banks.

The Isère, one of the most important of the tributaries of the Rhône, which rises in the highest part of the Alps near Mount Iseran, crosses the department in the northern part and falls into the Rhône on its border. About eighteen or twenty miles of its course belong to this department.

The Drôme rises on the eastern boundary of the department, and flows north-north-west about twenty-two miles to Die, receiving the little river Bes, or Bez, and some other streams by the way: from Die it flows seven or eight miles west to Pontaix, and from thence south five or six miles to the junction of the Rouane, or Roanne, which receives the Ribière, or Ribierre: from the junction of the Rouane the Drôme flows twenty-five miles west into the Rhône, receiving several streams by the way. Its whole course may be estimated at about sixty miles, all within the department: it is not navigable, but is used for floating timber below Luc sur Diois, about twelve miles from its source. From Luc to Die the timber is floated in rafts of twelve to fifteen trunks: from Die to Pontaix in single trunks, on account of the rocks which obstruct the bed of the river: below Pontaix the timber is again collected and formed into rafts. The Bez is also used for floating.

The other rivers of the department are very small. In the part northward of the Isère are the Suzon (twenty-five miles long, chiefly belonging to the department of Isère), the Bancel, and the Galaure, which all flow into the Rhône, and the Herbasse, which flows into the Isère. In the country between the Isère and the Drôme are the Bourne, which flows into the Isère; the Vernaison and Lyonne, which flow into the Bourne; the Leoncel, which joins the Lyonne; and the Veoure, which flows into the Rhône.

In the country south of the Drôme are the Roubion and the Jabron, which unite at Montelimar, and fall into the Rhône just below that town: the Berre, which falls into the Rhône near Pierre-latte, and the Lez, the Aigues and the Ouvèze, which all join the Rhône in the neighbouring department of Vaucluse. The Lez receives the Leron and some other streams, the Aigues receives the Oulle and the Zeynnées, and the Ouvèze receives the Tôlerene. The Rhône and the Isère are, we believe, the only navigable rivers. There are no canals in the department.

The great road from Paris by Lyon to Aix, Marseille, and Toulon, crosses the department from north to south, passing through the towns of St. Valier, Tain, Valence, Livron, Loriol, Montelimar, and Pierre-latte. From Valence a road runs north-east through Le Péage and Romans to St. Marcellin and Grenoble, in the department of Isère: another road, from Pont St. Esprit, on the Rhône, into the department of Hautes Alpes, and by Mont Genèvre into Italy, just crosses the southern part of this department through Nions or Nyons. The other roads are all bye-roads.

The department is very deficient in the means of communication with other parts.

The calcareous and argillaceous strata which occupy the mountainous tract in the east of the department occupy also the valley of the Rhône from the neighbourhood of the Drôme southward: the banks of the Drôme, the valley of the Rhône north of that river, and the valley of the Isère are occupied by the strata which are found above the chalk. The mineral treasures of the department are considerable: there are mines of copper and one mine of iron: granite, potters' clay, gypsum, coal, and fossil coal, are obtained.

and peat is dug for fuel. There are several mineral springs, but none of much repute.

The soil varies much; a considerable portion of it is so bad as to be hardly susceptible of cultivation. The highest parts of the mountains afford pasturage, but not wood; and the slopes, which might be expected to produce wood, present commonly nothing but bare rocks and steril hollows. But industry and care in manuring the land have rendered this department important, not only by the amount but the variety of its produce. The quantity of corn grown is not sufficient for home consumption; but there are olives, almonds, walnuts, and excellent wines, especially those of Tain (Hermitage, Côte Rôtie, &c.), L'Etoile, and Die. The neighbourhood of Romans and some other places yield truffles, which are considered nearly equal to those of Perigord. There are rich meadows and good pasture grounds, to which the flocks and herds of Provence are driven in the summer. Forests, chiefly of pine and beech, occupy nearly a seventh part of the department. Plantations of mulberry-trees, in which many silk-worms are reared, are numerous. Horses and neat cattle are not numerous; sheep are more so; the mules are small, the asses of good quality. The chamois, the wild goat, and a few bears, are found in the mountains. Game is abundant, but the rivers do not afford any great quantity of fish. The air is pure and healthy, and rather cold, except along the valley of the Rhône, where the heat in summer is very great.

The department is divided into four arrondissements: that of Valence, in the north, population 135,193; that of Die, in the east, population 65,663; that of Nyons, in the south-east, population 36,170; and that of Montelimar, in the south-west, population 62,530. The number of communes is 361, which are arranged in 28 cantons or districts, in the jurisdiction of a *juge de paix*. The chief towns are Valence, the capital, on the Rhône, population 8898 for the town, or 10,406 for the whole commune; Romans, on the Isère, population 7677 for the town, or 9285 for the whole commune; and Montelimar, near the Rhône, population 5816 for the town, or 7560 for the whole commune. [Montelimar; Romans; Valence.] Of the smaller towns we subjoin some account.

In the arrondissement of Valence are Moras (population of commune 4053); Le Grand Serre, near the Galaure; Saint Vallier (population estimated at 2000), and Tain (population 2139 for the town, 2340 for the whole commune), both on the Rhône; Montrigaud and St. Donat (population of the town 1591, of the whole commune 2084), both on the Herbasse; Montmiral; Le Péage (population 3095 for the town, 3577 for the whole commune), on the Isère; Alixan; Montellier; St. Jean de Royans, on the Lyonne; Chabeuil (population of commune 4452), on the Veoure; Etoile; Livron (population 1719 for the town, 3275 for the whole commune) and Loriol (population 1784 for the town, and 3048 for the whole commune), both on the Drôme; and Mirmande. St. Vallier is in a pleasant country; it has a Gothic château: the inhabitants are engaged in throwing silk, weaving linens, silks, and crape, pressing oil, and making porcelain and hats. Tain has an antient altar. A bridge of iron wire, completed in 1825, connects this town with that of Tournon on the opposite side of the Rhône. The wines of the neighbourhood have been noticed. Potter's clay is dug near the town.

At St. Donat some silk manufactures are carried on. Le Péage, though forming a separate commune, is really a suburb of Romans. Chabeuil is a place of considerable business; it has corn, oil, paper, and fulling mills, and some manufactories for woollen cloths. Livron and Loriol, on the opposite banks of the Drôme, just above its junction with the Rhône, are connected by a fine bridge.

In the arrondissement of Die are, Die, the capital (population 3213 for the town, 3555 for the whole commune), Pontaix, Saillans, Aouste, and Crest (population 3895 for the town, 4901 for the whole commune), all on the Drôme; Chatillon on the Bez; Beaufort; Bordeaux, Saou, and Puy St. Martin, on or near the Roubion; and La Motte Chalançon on the Oulle.

Die was known in the time of the Romans by the name of Dea Vocontiorum, being in the territory of the Vocontii. [Dauphiné.] It is not noticed by any of the antient geographers, but is found in the 'Itinerary' of Antoninus, and in that from Burdigala (Bordeaux) to Hierosolyma (Jerusalem), and in the Theodosian Table. In the middle ages it was the capital of Diois, one of the subdivisions of Dauphiné, and the seat of a bishoprick established in the fourth century, and for a long time united to that of Valence, but separated from it by Louis XIV. after the revocation of the edict of Nantes; it has been since suppressed. Die suffered much during the religious wars of the sixteenth century from the Huguenots: these seem to have retained a predominance in the town, as they had, previously to the revocation of the edict of Nantes, an academy here. The 'Dictionnaire Universel de la France' (Paris, 1804) enumerates as its manufactures paper, thrown silk, fustian, and cotton goods.

Crest was successfully defended in the crusade against the Albigenses by Aimar, count of Valence, who supported the count of Toulouse against the Catholics under Montfort. It has an antient castle in a picturesque situation on the brow of a hill commanding a delightful prospect. This castle has been used as a state prison. The town is at the foot of the castle hill. The inhabitants are engaged in the manufacture of woollen cloth, cottons, and silks; in dyeing and fulling cloths, and in pressing oil. (*Dict. Univ. de la France*, Paris, 1804; Vaysse de Villiers, *Itinéraire Descriptif de la France*, Paris, 1813.)

Aouste, which is mentioned in the Itineraries under the name of Augusta, and at which paper is made and oil expressed; Saillans, at which some silk and cotton manufactures are carried on; and Pontaix, at which some woollens are made, are all on the road between Crest and Die. At Beaufort, Bordeaux, and Saou, woollen goods are manufactured.

In the arrondissement of Nyons are only two towns, Nyons on the Aigues (population 2700 for the town, or 3397 for the whole commune), and Le Buis, on the Ouvèze (population 1886 for the town, or 2180 for the whole commune). Nyons is at the foot of Mount Devez, upon the slope of which it is partly built, and is divided into three quarters, each of which has an old wall inclosing it. It has a bridge built by the Romans, and in the environs are the ruins of an old castle demolished by the order of Louis XIII. Nyons was in the middle ages the frequent residence of the Dauphins of Viennois. The inhabitants are engaged in throwing silk and in making woollen stuffs and soap. It was the birth-place of Phillis, daughter of the Marquis de la Charce, a lady who, in 1692, put herself at the head of the inhabitants of the neighbourhood, and aided in repelling an invasion of the Savoyards. At Le Buis silk and leather are manufactured.

In the arrondissement of Montelimar are Marsanne, Dieu-le-fit on the Jabron (population of the town 3010, of the whole commune 3952), Châteauneuf du Rhône, Donzère, and Pierre-latte (population of the town 2388, of the whole commune 3447), all on the Rhône; Taulignan and Grignan, both near the Lez; and St. Paul-trois-Châteaux. Dieu-le-fit has in its neighbourhood three mineral springs: potter's clay and ochre are dug. Pottery and other earthenware, hats, woollen goods, and silks, are made in and about the town. Donzère produces wine, which has tolerable reputation. Pierre-latte is at the foot of a large rock, from which some would derive its name, Petra latra, or wide rock. At Taulignan and Grignan some silk manufactures are carried on: Grignan had formerly a castle, one of the finest in this part of France, now destroyed. Madame de Sevigné died at Grignan; her tomb remains in the church. St. Paul-trois-Châteaux was known to the Romans by the name of Augusta Tricastinorum, and was the chief town of the Tricastini. [Dauphiné.] It was in the middle ages the seat of a bishoprick founded in the fourth century; the bishop was a suffragan of the archbishop of Arles. It has some slight remains of antiquity. The inhabitants carry on trade in fine oil, wine, and silk.

The department of Drôme sends three members to the Chamber of Deputies. It constitutes the diocese of Valence, the bishop of which is a suffragan of the archbishop of Avignon: it is in the jurisdiction of the Cour Royale, or supreme court, of Grenoble, and in the district of the Académie Universitaire, or academical council, of that city: it is comprehended in the seventh military division, of which the head-quarters are at Grenoble. It was formerly included in Dauphiné.

The inhabitants of this department are of middling stature, active, robust, lively, and brave, but not disposed to labour. They are long-lived. Education is more attended to than in the majority of the French departments: there is one boy at school for every twenty inhabitants. (*Dictionnaire*

Universel de la France, Paris, 1804; *Dictionnaire Géographique Universel*, Paris, 1827; Vaysse de Villiers, *Itinéraire Descriptif de la France*, Paris, 1813; Malte Brun, Balbi, &c.)

DROMEDARY. [Camel, vol. vi., p. 191.]

DRO'MIA (Fabricius), a genus of brachyurous decapod crustaceans, placed by M. Latreille in the section of *Notopoda*, and referred by Dr. Leach to the family of *Thelxiopoda*.

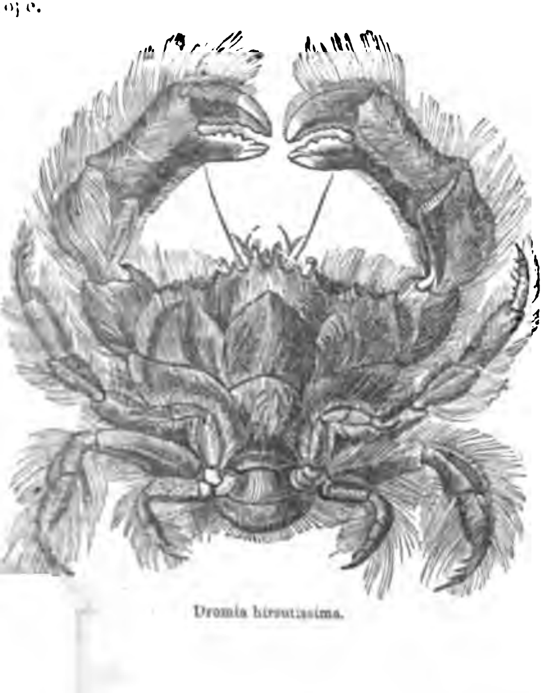
Generic character.—External *antennæ* small, inserted below the ocular peduncles; the intermediate antennæ placed below and a little within the eyes: external *jaw-feet* with their third joint nearly square, slightly notched at the extremity and within: claws (*chelæ*) great and strong; *feet* of the second and third pair terminated by a simple joint, and larger than those of the fourth and fifth pair, which are elevated on the back and provided with a claw, inasmuch as the last joint, which is bent and pointed, is opposed to a spine nearly of the same form, which terminates the penultimate joint: *carapace* oval, rounded, very convex, cut (découpée) on its anterior borders, hairy or rough (hérissée) as well as the feet and chelæ: *eyes* small, supported on short peduncles, rather approximated, and lodged in orbicular or cylindrical fossæ. (Desmarest.)

Geographical Distribution.—Probably extensive in the seas of warm climates. The Mediterranean, the Cape of Good Hope, and the Antilles, are given as localities.

Habits, &c.—The *Dromiæ* are indolent in their motions, and live in spots where the sea is moderately deep, choosing for their habitation places where the rocks are not hidden under the sand. They are almost always found covered with a species of *Alcyonium* or with valves of conchifers, which they retain with their four hinder feet, and which seems to serve them as a shield against their enemies. The *Alcyonia*, which are in general of the species named *Alcyonium Domuncula*, continue even to develop and extend themselves upon their carapace, which they at last entirely conceal. In the month of July, according to M. Risso, the females come out of the state of torpor (engourdissement) in which they ordinarily are, and betake themselves to the shallows for the purpose of depositing there a great number of eggs. (Desmarest.)

Place in the series.—*Dynomene*, according to Desmarest, should be placed next to *Dromia*, the former differing from the latter principally in having the feet of the fifth pair only instead of the four last, elevated on the back. In general the *Dromiæ* bear a great resemblance to the *Crabs*, properly so called, in the general form of the body, the structure of the parts of the mouth, the position of the antennæ, &c.; but they differ from them in the elevated situation of their four posterior feet and in their manners.

Example, *Dromia hirsutissima*. Carapace very convex, with six dentations on its lateral borders, and with a large sinus on each side of the front, which is nearly trilobated. Body covered with long red hairs. Locality, Cape of Good Hope.



Dromia hirsutissima.

DROMORE, a bishop's see in the ecclesiastical province of Armagh in Ireland. The chapter, which is regulated by patent of James I., consists of dean, precentor, chancellor, treasurer, archdeacon, and one prebendary. This diocese occupies the western portion of the county of Down, and extends partially into Armagh and Antrim. The greatest length from north to south is 35¼ English miles; and the greatest breadth, from east to west, 21¼ miles. It contains 26 parishes, constituting 25 benefices. In 1792 there were 27 churches of the establishment in this diocese: in 1[illegible] the numbers were, churches of the establishment 27; Roman Catholic churches, 34; Presbyterian churches, 4[illegible]; other houses of Protestant worship, 24. In the same year the gross population of this diocese was 188,209, of whom there were 41,737 members of the Established Church, 76,275 Roman Catholics, 69,264 Presbyterians, and 9[illegible] other Protestant dissenters. There were at the same time in this diocese 233 schools, educating 16,987 young persons, being in the proportion of $9\frac{1}{10}$ per cent. of the entire population under daily instruction, in which respect Dromore stands twelfth among the 32 dioceses of Ireland. Of the above schools 23 were in 1834 in connection with the National Board of Education.

The foundation of this see is attributed to St. Colman in the 6th century. Its early history is obscure, and there is no regular succession of bishops on record till after the 1[illegible] century. Dr. Jeremy Taylor, who had the administration of this diocese granted him in addition to that of Down and Connor by King Charles II. in 1661, and Dr. Percy, the learned collector of antient English ballad poetry, have been the most distinguished bishops of Dromore. The bishop's house, which is a plain mansion, was built by Doctor Beresford in 1792. Before his time the episcopal residence had been at Magheralin. By act 3rd and 4th Will. IV. c. 37, this bishopric when void becomes incorporated with the united diocese of Down and Connor, and its revenues vest in the board of Ecclesiastical Commissioners.

DROMORE, a pretty well built town and thriving linen market, in the barony of Lower Iveagh and County of Down, is situated on the Lagan, 66 Irish or 84 English miles from Dublin on the great northern road to Belfast. The cathedral is a mean structure on the bank of the river. East of Dromore stands a remarkable mound, 60 feet high, with three concentric entrenchments, and an extensive outwork towards the Lagan. The population of Dromore in 1[illegible] was 1942. (Beaufort's *Memoir of a Map of Ireland*; Harris's *Ware's Works*; *Reports, &c.*) [Down.]

DRONE. [Bee.]

DRONTE. [Dodo.]

DRONTHEIM. [Trondhjem.]

DROPSY, HYDROPS, a preternatural collection of watery fluid in different parts of the body. In the state of health, there is constantly poured out upon every surface, cavity, and interstice of the body, a watery fluid derived from the blood and deposited by the capillary blood-vessels. [Capillaries.] This fluid does not remain long where it is deposited, but by vessels appropriated to the office, termed absorbents, is soon taken up and reconveyed into the common circulating mass. As long as there is a perfect balance of action between these two sets of vessels, which is always the case in health, there is no accumulation of fluid, the exhalation and the absorption being always exactly equal. But if from any cause that balance be disturbed; if either the capillary blood-vessels pour out an unusual quantity of fluid, or if the absorbents fail to act with their accustomed energy, an accumulation of fluid must necessarily take place, and this accumulation, when it amounts to an appreciable quantity, constitutes the disease called dropsy. It follows that dropsy must always be the consequence either of increased exhalation or of diminished absorption.

The causes which lead to increased effusion are exceedingly various; but they are all resolvable either into those which produce a morbid condition of the blood-vessels, obstruction to the free circulation of the blood, or a morbid condition of the blood itself. The morbid condition of the blood-vessels may be of two opposite kinds, either that of preternatural strength, in consequence of which their action may be so excited as to pour out an unusual quantity of fluid; or that of extreme debility, in consequence of which they may be unable to prevent a preternatural exudation of the thinner parts of the blood through their relaxed coats. These different states of the blood-vessels depend on two diametrically opposite conditions of the system, and acc ingly the different species of dropsy are very generally divided into active or passive, acute or chronic, sthenic or asthenic.

Whenever an obstacle is opposed to the free return of the blood from the capillary arteries into the capillary veins, the blood accumulates in the capillary arteries, which are the exhalant vessels. By this accumulation of blood in the exhalants, either their action is increased, the consequence of which is increased exhalation; or their action is diminished and their tone destroyed, the consequence of which is equally increased exhalation. Various morbid conditions of many organs oppose a free return of the circulating blood from the capillary arteries into the capillary veins: any disease of the right side of the heart, for example, which prevents its receiving from the great venous trunks of the body the quantity of blood in a given time, which is necessary to maintain the balance of the circulation; any disease of the lungs, which prevents the lungs from receiving from the right ventricle of the heart the full quantity of blood which the heart has received from the great venous trunks; any disease of the liver, which prevents the liver from receiving by the great vein which ramifies through it, the vena portæ, the full quantity of blood which it ought to receive from the different abdominal viscera; any disease of the great blood-vessels themselves, by which the current of the circulating blood is prevented from passing freely through them. Such a disease of the heart may be occasioned by an ossification of its valves; of the lungs, by an obliteration or compression of its air vesicles, upon the walls of which the capillary terminations of the pulmonary artery are distributed; of the liver, by an induration of its substance and a consequent mechanical compression of the minute branches of the vena portæ; of the great blood-vessels, by diseases of their coats giving rise to the tumours called aneurisms, or by the compression of tumours existing in neighbouring parts, scirrhous, fatty, or watery tumours, which may have their seat in any organ, or by the compression of the great venous trunks of the system by the bulk of the distended uterus in pregnant women.

When dropsy is the result of an increased action of the capillary blood-vessels, it is considered a primary or idiopathic disease, and constitutes the sthenic, tonic, active, or acute dropsy of authors. In this case the capillaries are supposed to be in that state, whatever it may be, which constitutes acute inflammation. The increased effusion, which constitutes the dropsy, is the result of that increased action, and by the effusion the inflamed state of the vessels is often removed.

This form of dropsy occurs most frequently in the young, the plethoric, and the robust. It is induced by all the causes of inflammation, such as cold, suddenly checked perspiration, suppression of any of the natural secretions and discharges, a plethoric condition of the system, a recession of acute diseases of the skin, &c. It has its seat most frequently in the serous membranes of the great cavities of the body, the walls of which are lined by these membranes, as those of the chest and abdomen; or of the viscera to which these membranes afford an external covering, as the brain, the lungs, the heart, the liver, and all the abdominal and pelvic viscera.

This form of dropsy is attended with a greater or less degree of fever, the invariable concomitant of acute inflammation. The febrile symptoms are general uneasiness, more or less restlessness, pains in the back and limbs, heat of skin, preceded by chilliness, headache, suppression of the secretions and excretions, and consequently a dry or clammy state of the mouth, a constipated state of the bowels, and a loss of appetite. The pulse is always excited, and is usually full and hard, or small and sharp. There is commonly some degree of pain in the organ in which the inflammation has its principal seat. When the inflammation and febrile symptoms are intense, the pain is usually acute and its seat clearly defined; but when the inflammation and febrile symptoms are not very intense, the pain may be slight and its seat correspondingly obscure; but some degree of pain or uneasiness may generally be found if carefully sought for, and at all events the true seat of the inflammation may be usually detected by the disordered function of the affected organ.

When this condition of the system exists with a certain degree of intensity it constitutes the most acute form of dropsy; but when it exists with less intensity it gives rise to another form of the disease, termed sub-acute dropsy, in which the symptoms are the same but less urgent. In this case there is often little or no local pain; the febrile symptoms are milder, the general uneasiness is less prominent, the skin less hot; there may be little or no thirst, and the pulse much less hard and sharp. This form of the disease is equally dangerous in itself, and often more fatal in consequence of its true nature being overlooked, until it has made such progress that its course is no longer to be checked. It is often the consequence of more acute diseases, and frequently follows scarlet fever, measles, bronchitis, inflammation of the pleura, inflammation of the liver, influenza, &c. The original and urgent disease may subside, and then comes on slowly and almost imperceptibly this insidious and fatal malady.

The third form of dropsy is that termed asthenic, or passive. It is so generally the consequence of some other morbid condition of the system that it is not usually considered a primary or idiopathic disease, but merely a sequent or ultimate result of some other pathological state. Its proximate cause is considered to consist partly of a laxity of the tissues of the exhalant vessels, in consequence of which they are incapable of retaining the fluid part of the blood; and partly of an altered condition of the blood itself, in which its solid portions, namely, its albumen, fibrin, and red particles (Blood), are preternaturally diminished and its serum proportionally increased. The state of the system in which this form of dropsy usually comes on, and the causes which most frequently and obviously induce it, are supposed to conduce equally to this morbid state of the containing vessels and the contained blood. The state of the system in which it comes on is that of extreme debility, however induced; but its ordinary exciting causes have so obvious and great a tendency to exhaust the vital power, that they are usually denominated debilitating causes; such are fever, whether intermittent or continued, remittent or typhus, long continued and excessive evacuations, whether of natural discharges, or of preternatural effusions of blood, deficient or unwholesome diet, diseases of the digestive organs, by which the due assimilation of the food is prevented, intemperance in the use of intoxicating liquors, whence drunkards of all kinds, and especially dram-drinkers, so commonly, nay, almost invariably, die of dropsy.

The acute and inflammatory forms of dropsy ordinarily produce increased exhalation only into particular parts of the body; but this state of general debility may give rise to an increased exhalation into every cavity and interstice, and thus bring on a general dropsy. Thus it is by no means uncommon to have at one and the same time effusions into the cavity of the cranium, into that of the thorax, into that of the abdomen, and likewise into the cellular tissue almost over the whole body. In such cases the operation of a general cause is rendered manifest by these several dropsies increasing in one part as they diminish in another, and this alternately in the different parts. This combination of the different species of dropsy, or rather, as it may be justly termed, this universal dropsy, must, it is argued, be referred to a general cause, and in most instances, hardly any other can be thought of but a general laxity of the exhalants. It is this which constitutes what is called the hydropic diathesis, which frequently occurs by itself, and frequently concurring with other causes, is especially that which gives them their full effect. This state of the system, when it first comes on, gives rise to a disordered, enfeebled, and wasted appearance of the body, which is commonly called a breaking up of the constitution, and is technically termed a cachexy; in a very short space of time it is usually followed by general dropsy.

All the acute inflammatory and febrile symptoms so characteristic of the other forms of dropsy are of course absent in this. The skin, instead of being hot, is often unusually cold; the pulse, instead of being full and hard, is weak, small, unequal, and rapid; the contraction of the heart is so feeble that slight causes often completely arrest its action, and render it incapable of carrying on the circulation, whence the patient drops down dead instantaneously, perhaps on endeavouring to walk down stairs, or to move from one chair to another; the muscles in general are flaccid, all the movements are weak, irregular, and uncertain, and all the actions of the system exceedingly feeble.

It is more especially this last form of dropsy which is induced by a morbid change in the constitution of the blood, namely, an increase in the proportion of its serum. An unusual quantity of water taken into the body, and not carried off by the excretory organs, may possibly give rise to such a condition of the blood, and accordingly it is said that suddenly drinking large draughts of very cold water has been immediately followed by dropsy, probably from the cold producing a constriction of the excretories; in consequence of which they are unable to carry off the water as it flows into the mass of blood and thus to maintain its proper constitution. A preternatural abundance of the more fluid parts of the blood may also accumulate in the circulating mass by a suppression or diminution of the ordinary aqueous excretions. Hence the influence of a cold and moist atmosphere in inducing dropsy; and the highly important influence of diseases of the kidneys in producing the disease. It is found that there are several different diseases of the kidneys of which dropsy is the ordinary result. It is the office of the kidney to remove from the blood a large proportion of its fluid parts; it is an excreting and depurating organ of the greatest importance. Any disorder of it which interferes with the performance of its function may therefore occasion an accumulation of the watery particles of the blood, and thus give rise to dropsy; and it is actually found that when the secretion of the urine is suppressed, the watery portion of the blood is often poured into some of the internal cavities. Moreover, large abstractions of blood are frequently followed by dropsy, because the albumen, the fibrin, and the red particles which constitute the solid parts of the blood are not so easily renewed as the serum, and the superabundant serum readily passes off by the exhalants preternaturally relaxed by the debilitated state of the system induced by the bleeding.

The parts of the body in which the dropsical effusions usually collect are the cavities of the cranium, chest and abdomen, and the interstices of the cellular tissue diffused over the whole body, and forming a constituent element of every organ.

The dropsical fluid itself consists for the most part of the serum of the blood; but its sensible properties and its chemical constitution vary exceedingly according to the form of the disease and the condition of the capillary vessels at the moment the effusion takes place. If the vascular action have been great, the fluid is yellow or straw-coloured like whey, and is more or less turbid, and contains minute particles of albumen and fibrin. If, instead of excited vascular action, the effusion have been the consequence of an altered condition of the blood, the fluid is dark-coloured and turbid, probably from the admixture of the red particles of the blood. If the effusion have taken place very slowly in consequence of the operation of some cause progressively but not rapidly impeding the circulation more and more, the fluid is almost colourless and nearly destitute of animal matter. If the fluid have been long retained in the cavity containing it, it may be of all colours and consistence, and its sensible properties may be infinitely diversified, and these diversities are apparently increased by the admission of the external air to the cavity in consequence of the artificial removal of the fluid by the operation called tapping.

But another general cause of dropsy has been stated to be interruption or diminution of the absorption which should take up the exhaled fluids from the several cavities and interstices of the body. It is obvious that absorption may be diminished, or may cease altogether, from a loss of tone in the proper absorbent vessels. Without doubt, a certain degree of tone or power is necessary in the absorbent extremities to enable them to perform their office; and it was justly observed by Cullen, that the same general debility which produces that laxity of the exhalant vessels which constitutes the hydropic diathesis, occasions at the same time a loss of tone in the absorbents; that therefore a laxity of the exhalants generally accompanies a loss of tone in the absorbents, that consequently a diminution of absorption must have a considerable share in the production of dropsy; and that this is rendered the more probable since dropsies are often cured by medicines which seem to operate by exciting the action of the absorbents.

There are many diseases of which dropsy is the sequent, and the dropsy induced by these diseases is called secondary, consecutive, symptomatic, or passive, in contradistinction to the primary, active and acute forms. The diseases [illegible] dropsy as their most frequent consequent have [illegible] usual seat in the heart and its great vessels, in [illegible] the liver, the spleen, the kidneys, the uterus, and the ovaria. When dropsy is the consequence of disease of the heart, the signs of disease of the heart commonly long precede the appearance of the dropsy. The diseases of the heart which most commonly give rise to dropsy are passive dilatation of its muscular parietes and ossification of its valves, the existence of which may be ascertained with tolerable certainty both by certain signs which are pathognomonic of these organic changes, and by auscultation. When dropsy is the consequence of disease of the heart, the effusion is commonly indicated first by swelling of the face, especially beneath the eyelids, and next by swelling of the feet and ankles, and of the hands and arms, particularly of the left. As in the progress of the disease the effusion collects and accumulates in the cavity of the thorax, or in that of the pericardium, it is denoted by a peculiar train of symptoms hereafter to be described. [HYDROTHORAX and HYDROPS PERICARDII.] The respiration is always more or less embarrassed; the horizontal position uneasy, and often impossible; the pulse, which is seldom or never natural, is very variously affected. Whenever there is a watery swelling of the face, hands, arms, or ankles, with an impaired state of the constitution, the consequence of protracted ill health, and without manifest disease of the lungs, it may be certainly inferred that there is a disease of the heart. The dropsy which results from disease of the heart is very often completely removed by appropriate remedies. The effusion often recurs indeed, and is again removed, and this successive recurrence and removal of the affection takes place indefinitely until the cardiac disease, on which the effusion depends, reaches a point which is no longer compatible with life.

Diseases of the coats of the great blood-vessels constituting aneurism, concretions within their cavities, or tumors of neighbouring parts, pressing upon their trunks, and obstructing the passage of the blood through their canal, are frequent causes of consecutive dropsy. Inflammation of the pleura lining the cavities of the chest, inflammation and congestion of the lungs, the consolidation or hepatization of the substance of the lungs, and the obliteration of the air-vesicles by the deposition of tuberculous matter, may give rise to effusion either into the cavity of the chest, or into the cellular tissue forming the parenchyma of the lungs, or into the cellular tissue diffused over the whole body.

Inflammation of the liver, generally of a slow or chronic nature, leading to a deposition of adventitious matter in its substance, and the consequent enlargement of the organ and the consolidation of its tissue, is a common cause of dropsy, occasioned by the obstruction to the circulation through the vena portæ, the effusion being in this case often confined to the cavity of the abdomen.

The spleen, which consists of a congeries of blood-vessels, and which is very apt to be enlarged and obstructed, may occasion effusion into the abdomen in the same manner as disease of the liver.

The kidneys are subject both to functional and organic diseases, which are followed by effusions into all the cavities, in consequence of the failure of these organs to remove from the common mass of blood the superfluous and noxious principles which it is their office to eliminate.

Dropsical effusions are often poured into the uterus and ovaria, in consequence of primary disease in these organs; at other times tumors are formed within or attached to them, which press upon and compress the trunks of neighbouring blood-vessels, and thus occasion dropsy by a mechanical obstruction to the circulation of the blood.

It is an interesting and important fact, that while in this disease the thinner parts of the blood are thus poured out into the several cavities and interstices of the body, the kidneys often remove to a very large extent the more solid portions of the blood, more especially the albumen, and sometimes even the red particles. Hence there are several forms of dropsy in which the urine is loaded with a preternatural quantity of albumen, the presence of which may be detected by the application of heat, nitric or muriatic acids, alcohol, or corrosive sublimate, to the urine, all of which coagulate the albumen and thus render it visible. But albumen is not always contained in the urine of dropsical patients. It is of some importance in practice to discriminate the cases with albuminous urine from those without it, since there are remedies of great efficacy in the latter form of the disease which are useless, if not injurious, in the former. Thus the would indicate that dropsy with albuminous urine has its seat in a particular set of organs, and is dependent on a peculiar morbid action of those organs; and although very much still remains to be ascertained in relation to these points, yet some progress has been made at least towards determining the seat of the malady, if not the nature of the affection when the urine is albuminous. The condition of the urine in this respect ought therefore always to be examined, because it may throw some light however small on the constitutional and local disorder, and may be some guide to the judgment in the selection of remedies.

Dropsy is always a formidable and often a highly dangerous disease. Its acute forms, though attended with the most urgent symptoms, are in general less unfavourable than most of its chronic forms, because in the former, though the disordered actions may be very intense and dangerous, yet they are more under the control of remedial agents, and they often do not depend on any irreparable injury of the constitution; whereas the latter are the sign and the result of deep-seated and surely advancing disease. Of course the prognosis in any particular case must entirely depend on the seat and nature of the disease of which it is the sequent.

There is no disease which requires a more varied treatment than dropsy, because, like fever, dropsy may exist in, and be essentially connected with, diametrically opposite morbid conditions of the system. Dropsy may depend on a state of the system, for the removal of which all other remedies will be tried in vain unless their application be preceded by a decided abstraction of blood: dropsy may depend on a state of the system in which the abstraction of the smallest quantity of blood may prove almost instantaneously fatal: in the former case stimulants and cordials invariably increase the intensity of the disease; in the latter they are indispensable to the preservation of life. On the clear discrimination of these two different states of the system, and the two different classes of disease to which they give rise, and on the sagacious detection of the different shades by which they may appear to be blended with and lost in each other, the successful treatment of dropsy mainly depends.

In the acute form of dropsy dependent on active inflammation, blood-letting is necessary, just as it is in ordinary inflammation, the quantity of blood which it is proper to abstract depending, of course, on the organ inflamed, on the intensity of the inflammation, and on the strength of the constitution. One full bleeding will commonly suffice; but there are many cases in which its repetition is indispensable. In the great majority of cases, however, after a full bleeding from the arm, the local will be preferable to a repetition of the general bleeding.

The next indication after blood-letting is to equalize the circulation and to promote the secretions. This is most effectually accomplished by bringing the system under the influence of mercury, by calomel combined with James's Powder or with opium, and this treatment may be combined with diuretics, of which digitalis is the best.

In the subacute form the same general plan of treatment is necessary, but it can by no means be carried to the same extent, and in each individual case the application of the remedies employed must of course be modified according to the circumstances peculiar to that case.

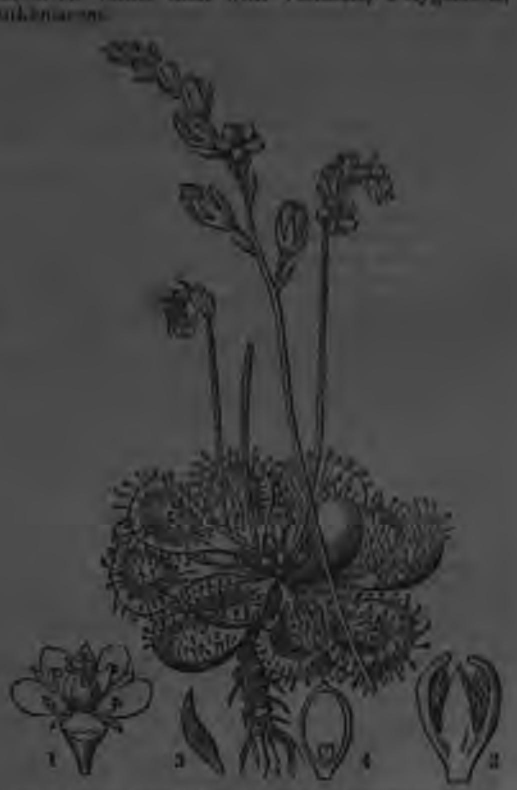
In the chronic, passive, or asthenic form, life would be destroyed by the employment of the remedies which alone are efficacious in the acute form. In this debilitated state of the system the abstraction of the smallest quantity of blood is highly pernicious. The safer and the most efficient remedies in this form of the disease are tonics, the laxatives called deobstruents, taraxacum, mild unirritating doses of mercury, and iodine, particularly in the form of the hydriodate of potass.

The only effectual treatment of consecutive dropsy is that which is proper to the removal of the primary disease. But the detection of the true seat and nature of those organic diseases which are antecedent to dropsy is often a matter of extreme difficulty, requiring patient and acute investigation, and an extensive and precise acquaintance with pathology. And the treatment of the disease when ascertained, the selection of the appropriate remedies, and the employment of those with due, and only with due, activity and vigour, is a delicate and difficult task, sometimes rewarded, when performed with sagacity and skill, with a degree of success not to have been anticipated. It is pre-eminently in cases like these that the scientific and discerning physician keeps alive the ignorant, careless, and routine practitioner destroys. [HYDROCEPHALUS; HYDROPS PERICARDII; HYDROTHORAX, &c.]

DROPWORT, a poisonous wild umbelliferous plant, with fleshy fingered roots, inhabiting ditches and wet places. It has been sometimes sold fraudulently by ignorant gardeners as a new species of dahlia. Its botanical name is *Œnanthe crocata*.

DROSERACEÆ, a natural order of albuminous exogenous plants, consisting of marsh herbs, whose leaves are usually covered with glands or glandular hairs, and whose flowers are arranged in circinate racemes. The calyx consists of five sepals; there are five petals, five or ten hypogynous stamens, a one-celled many-seeded capsular fruit, and minute seeds, having an embryo lying at the base of a large quantity of albumen. There are many species of the genus drosera, called in English sundews, more remarkable for the singular structure of their glandular hairiness than for the beauty of their flowers, and of no known use. A few other little-known genera are associated with it; and it is probable that *dionæa* (DIONÆA), whose singular irritable leaves have much analogy with those of droseras, also forms a part of the order, notwithstanding its indehiscent fruit and erect vernation.

De Candolle having incorrectly described the embryo as lying in the axis of the albumen, the true affinities of the order were overlooked; they have lately however been more correctly determined to be with Cephalotaceæ and Francoaceæ rather than with Violaceæ, Polygalaceæ, or Frankeniaceæ.



A plant of *Drosera rotundifolia*. 1, a complete flower magnified; 2, a ripe capsule magnified—the seeds are seen between the valves of the capsule; 3, a seed very much magnified—the dark space in the middle is the nucleus, the remainder is a loose integument that invests the seed; 4, a section of the nucleus still more magnified—here the minute dicotyledonous embryo is seen at the base of the albumen.

DROWNING, the state of asphyxia [ASPHYXIA] produced by the immersion of the body under water. When a warm-blooded animal is immersed under water, and forcibly retained there, he immediately begins to struggle violently, and uses every effort to rise to the surface. These struggles are not at first the result of pain, but of fear. It is proved by direct experiment that the obstruction to the respiration which produces pain does not come on for some time. The point of time when the painful impediment to respiration occurs is well ascertained. For the reason assigned in the article ASPHYXIA, in the space of three quarters of a minute a violent effort is made to inspire, to expand the lungs with air, but no air can enter. Every

effort to inspire is followed by a corresponding effort to expire. At each expiration a small quantity of air is expelled from the lungs, and is seen under the surface of the water in the form of bubbles; for although the water excludes the air from entering the lungs, notwithstanding the most violent efforts to inspire, yet it cannot prevent some portion of air from being expelled from the lungs by the violent efforts to expire. The ultimate result of these repeated and violent expirations is greatly to diminish the bulk of the lungs, and to bring them to the utmost degree of collapse to which it is possible to reduce them by any voluntary or instinctive efforts which the animal is capable of making.

When a human being is drowned by accident, if the fall has been from a considerable height and the water is not of very great depth, the body is precipitated to the bottom of the water; it then quickly rises to the surface, partly because the specific gravity of the body, when the lungs are full of air, is less than that of water, and partly because the body is rendered still lighter by the air, always amounting to a considerable quantity, which is collected and retained in the clothes. If the person be not able to swim, he generally struggles violently, and probably screams; by these efforts the lungs are partly emptied of the air they contained, the comparative weight of the body is increased, and consequently it again sinks to the bottom, but it soon again rises, and this alternate rising and sinking may occur several times in succession. Whenever the body comes to the surface and the mouth is above water, the painful impediment to respiration produces an instinctive effort to inspire, and a hurried gasp is made to obtain air. But often the mouth is not sufficiently above the surface of the water to obtain air without respiring a quantity of water along with it; but the quantity of water received in this manner is never great, probably not more than is expelled by the cough excited by the irritation of the glottis in consequence of the contact of the water and by the subsequent expiration. Every instant the body remains in the water, for the reasons immediately to be assigned, the powers of sensation and of voluntary motion rapidly diminish, and at length, perfectly insensible and motionless, it remains at the bottom of the water, where, if wholly undisturbed, it continues until the disengagement of various gases in the progress of putrefaction renders it again specifically lighter than water, and brings it once more to the surface.

The change in the system produced by continued submersion, the consequent suspension of respiration, and the necessary extinction of life, are all referrible to one pathological condition, namely, a change in the nature of the blood. The water prevents any portion of air from entering by the trachea to the air vesicles of the lungs; consequently no air comes in contact with the venous blood contained in the capillary branches of the pulmonary artery which are spread out upon the walls of these air vesicles; the venous blood which flows to the lungs is therefore incapable of being converted into arterial blood, whence the lungs can deliver to the left side of the heart only venous blood to be sent out to the system. As the circulation goes on, all the arterial blood in the body is at length converted into venous, and flows into the great venous trunks of the system, by which it is returned to the right side of the heart, and thence to the lungs, where it undergoes no change, but remains venous. These currents of venous blood, and of venous blood only, are successively sent out to the system. But venous blood is incapable of maintaining the action and vitality of the brain and spinal cord of the heart, of the voluntary muscles, or of any organ of the body, and consequently, when nothing but venous blood circulates in the system, the death of all the organs is the sure and quick result, and the organs die in the order and mode already described. [ASPHYXIA.]

Taking the average of a great number of experiments, it is found that when an animal is forcibly and continuously held under water, the blood in the arteries loses its vermilion colour, and begins to grow venous in the space of three quarters of a minute. In one minute and a quarter it is obviously dark. In one minute and a half, no difference can be distinguished between the blood in the arteries and the blood in the veins; consequently, in an animal that is submersed and that never rises to the surface, the system is completely under the influence of venous blood in of one minute and a half, and though the body main under water half an hour, the blood does not become sensibly darker, because it can only be completely venous.

Circumstances may make a few seconds difference in regard to the point of time when these phenomena take place. If for example an animal be submersed at the instant of expiration, the colour of the blood is lost somewhat sooner than when it is submersed at the instant of inspiration, and if the animal be much alarmed and struggle violently, the change takes place with greater rapidity; but the difference from any cause of this kind never amounts to more than a few seconds. Age however is capable of effecting a more remarkable difference. It is proved by numerous and accurate experiments that the younger the animal the longer it can live when deprived of air by submersion. If, as is commonly the case, an adult warm-blooded animal be irrecoverably dead in the space of four minutes after complete and continuous submersion, an animal of the same species only a few days old will live twelve minutes. A pup will live considerably longer than a young dog, a young longer than a middle aged dog, and a middle aged longer than an old dog.

Sensibility and the power of voluntary motion are diminished the moment the arterial blood begins to lose its vermilion colour; an animal is completely insensible, and has wholly lost all power of voluntary motion, that is, it is in a state of apparent death, as soon as the arterial blood is completely venous. In one minute and a half, then, after complete and continuous submersion, animal life is completely extinguished. But by the prompt and vigorous use of the appropriate remedies, recovery from this state is possible; because the organic functions go on for a considerable period after apparent death, and death is not real until the organic functions have wholly ceased. Nevertheless, though the organic functions may continue for an indefinite period after the animal functions are extinguished, from ten minutes to half an hour, or more, yet, in no instance in which the experiment has been fairly tried has any adult warm-blood animal that has been completely and continuously submersed for the space of four minutes been capable of resuscitation, though all the means of restoring animation may have been instantaneously and most actively and judiciously employed. Accordingly it is found in practice that the immediate and vigorous use of the best means for restoring animation often fail when the person has not been in the water more than four minutes. In general, however, if the body has not been in the water longer than from five to eight minutes, the prompt and persevering use of the proper means for restoring animation will succeed; no doubt, because in some one of or in all the times that the body has come to the surface air has been obtained and conveyed to the lungs in the hurried gasp instinctively made at these moments. Still it is exceedingly rare that persons are recovered who have been in the water fifteen minutes; occasionally however animation is restored after a submersion of twenty minutes, or even half an hour; and apparently authenticated cases are on record in which resuscitation was accomplished after the body had been in the water for three-fourths of an hour. In these cases, circumstances must have favoured the occasional inspiration of air; it is utterly impossible that life can have been maintained so long unless the individual had breathed at intervals during the time; and as none can tell what circumstances may have occurred favourable to the inspiration of air, it is an imperative duty in all cases to resort to the proper means for restoring animation with all the promptitude and energy possible.

When a person who has been drowned, who was previously in a state of sound health, is taken out of the water, the appearances presented by the body are the following:—

The whole of the external surface is cold; the colour of the skin is pallid, excepting in the parts where it is livid rather than pallid, as in the face, which is always either entirely pale or slightly livid. The eyes are half open, and the pupils much dilated. The mouth and the nostrils contain a great deal of frothy fluid. A large quantity of the same kind of fluid is contained in the trachea, the bronchial tubes, and the air vesicles of the lungs. The tongue is protruded between the teeth, and approaches to the under edge of the lips. The whole head is sometimes much swollen, and the features occasionally present the appearance of those of a person who has died from apoplexy; and this is said to be particularly the case with those who have fallen into the water in a state of intoxication. It is usually considered as a sign that a person has been drowned while living, and that the body has not been thrown into the water after death, that the ends of the fingers are excoriated, and that there is a collection of dirt or sand under the nails, appearances resulting from the efforts which the drowning person has made to avert his impending fate; but if the water be deep, no appearance of this kind is present, because the power of struggling is over before the body touches the ground, and a person in the state of intoxication, who falls into deep water, may expire without the power to make a single effort to save himself.

With regard to the internal organs, the heart and its great blood-vessels are always found preternaturally loaded with dark-coloured blood, sometimes to such an extent that the heart seems completely to fill the bag of the pericardium. This accumulation of black blood is always on the right side of the heart, which usually contains somewhat more than double the quantity contained in the left cavities.

The lungs are invariably very much reduced in volume, and are exceedingly loaded with black blood. Both the pulmonary arteries and veins are likewise distended with black blood.

The substance of the brain is of a darker colour than natural, and its vessels are commonly turgid with black blood; but sometimes the turgescence of the cerebral blood-vessels is not in proportion to the accumulation of blood in the other organs.

There is always a quantity of water mixed with frothy matter in the trachea and bronchi. Occasionally this frothy matter is mixed with blood. The quantity varies a good deal in different cases, but it is never very great. At one time it was thought to be so great as to be the cause of death in drowning. It was conceived that the water flows into the lungs by the trachea in such abundance as to occasion asphyxia. The controversy which was long agitated on this point is now set at rest by numerous and accurate experiments, which demonstrate that only a very inconsiderable quantity of water enters the trachea, and never sufficient to occasion death.

A similar controversy prevailed on the question whether water enters the stomach, which is now equally decided in the negative. It is proved beyond all doubt that no water passes into the stomach, or at least that no quantity enters it capable of contributing in the slightest degree to the fatal event. The establishment of this point is important, because the contrary notion had led to the adoption of most pernicious practices. With a view of evacuating the water supposed to be accumulated in the lungs and stomach, the bodies of the drowned, when taken out of the water, were held up by the heels, rolled on barrels, and subjected to other practices calculated rapidly to extinguish any remaining spark of life; and though the notion which led to these absurd practices is exploded, the practices themselves continue. In a paper published in the 'Medical Repository' for July, 1824, Mr. D. Johnson, surgeon, Farringdon, in detailing a case of suspended animation in a seaman who had fallen from a yard-arm into the sea when the ship was going at the rate of nine knots and a half per hour, and was afterwards picked up in an insensible state, says, 'When brought on board the ship he showed no signs of life. I had him immediately suspended with his head downwards, and well shaken for a minute or two. He was then laid on the cabin-table, and rubbed all over by two or three men with flannels, &c. Tartarized antimony was rubbed into the root of the tongue, and tobacco-smoke blown into the mouth and nostrils.' Short of decapitation no experiments could be devised better calculated to destroy the smallest chance of resuscitation.

The proper remedies for the recovery of the drowned are few and simple. The body, placed on a bed-chair, should be removed to the receiving house or any place where the conveniences required may be most easily obtained. The wet clothes should be stripped off as rapidly as possible, the body well dried and surrounded by warm air, if it can be readily procured, by the portable warm air bath, of which there ought to be one at every receiving house. At first the heated air should only be a few degrees above the temperature of the body, and the heat, which ought always to be ascertained by a thermometer, should be subsequently increased with caution. The body being thus surrounded with warm air, artificial respiration should be performed without the delay of a moment, and this should be assisted by electricity applied at first in the form of very gentle shocks.

By the application of heat the capillary blood-vessels are stimulated to action, the determination of blood towards the external surface of the body is favoured, and the internal organs are thus relieved of their oppressive load. By artificial respiration the cavity of the chest is enlarged, the collapsed state of the lungs is removed, and atmospheric air, the great agent needed for the decarbonization of the blood, and on the want of which all the dangerous phenomena of drowning depend, is transmitted to the lungs and brought into contact with the venalized blood. By electricity the organs which carry on the mechanical part of respiration, that is, those which alternately enlarge and diminish the capacity of the thorax are roused and excited to resume their natural action. There are some few other useful auxiliaries, but so important and efficacious are these three powerful agents, when judiciously and perseveringly employed, that they may be considered as the only remedies worth regarding. But unfortunately they are as potent for evil as for good. A slight mismanagement of any of them may utterly destroy that life which the delicate and skilful use of it would have reanimated. It is impossible in this place to enter into a detail of the dangers with which the incautious employment of these powerful remedies is fraught, or minutely to detail the mode in which they ought to be applied in practice. It is a subject which deserves much greater attention than it has hitherto received. The apparatus for heating the bodies of the drowned, for the artificial inflation of the lungs, and for the application of electricity, are susceptible of vast improvement both with reference to the efficacy and the safety of these remedies; and there are few subjects to which mechanical genius and scientific knowledge could be applied with greater prospect of conferring signal service on mankind.

DRUIDICAL BUILDINGS. [AVEBURY; CARNAC; STONEHENGE.]

DRUIDS. [BRITANNIA.]

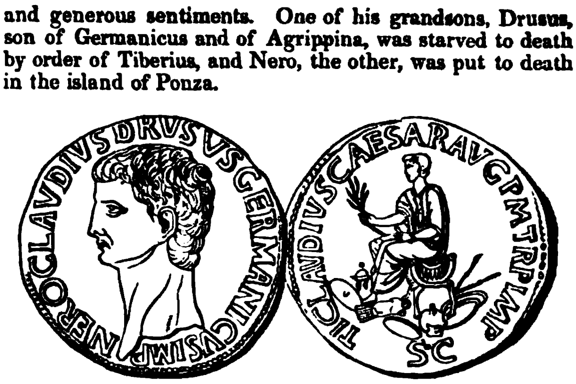
DRUM, a pulsatile musical instrument, of which there are three kinds,—the *Side Drum*; the *Base* or *Turkish Drum*; and the *Double Drum*. The first is a cylinder, formerly of wood, but now invariably of brass, on each end of which is a hoop covered with vellum or parchment. This is the ordinary regimental drum. The second is formed as the first, but of oak, on a much larger scale, and used, not in conjunction with the fifes, but as part of the regimental band. It is likewise employed occasionally in the orchestra. The third is made of copper, nearly hemispherical, covered with a strong *head* of calf's-skin, and stands on three iron legs. The Double Drums vary in dimensions, from nineteen inches to three feet in diameter. They are always in pairs, and are tuned, by means of many screws which tighten the head, to the key-note and the fourth below. Very recently, however, a most decided improvement has been effected in the manner of tuning these instruments. By means of a lever operating on several hooks which act simultaneously on the head, or hoop on which the skin is strained, the tuning is performed at once, and with such rapidity, that, in our presence, the melody of 'God save the King' was performed on a single drum in a time not much slower than that usually adopted. A patent has been obtained by the ingenious mechanist (Mr. Cornelius Ward) to whom we are indebted for this useful invention; and it is to be presumed that in future all double drums will be constructed on his principle.

DRUM. [DOME.]

DRUMMOND, WILLIAM, the son of Sir William Drummond of Hawthornden, was born December 13, 1585. He was educated at Edinburgh, and studied civil law in France. On his father's death, in 1610, he relinquished his profession and devoted himself to literary pursuits at his paternal mansion of Hawthornden. He did not, however, experience that freedom from trials which he had probably anticipated in his retirement. His betrothed bride died on the eve of their marriage; and in order to divert his thoughts from brooding over this deep and bitter affliction, he undertook a tour which lasted eight years, during which time he visited Germany, France, and Italy, and collected a library of great value, of which part is now in the possession of the university of Edinburgh. In his 45th year he married a lady whose fancied likeness to the former object of his affections is said to have constituted her chief attraction for him. When the civil war broke out, his [illegible] a sort of [illegible] Buonaparte's time. [illegible] of Acre. [illegible] territories. [illegible] Syria. Captain Light's *Travels* [illegible] *and Cyprus in* [illegible] of the Druses is Deir el [illegible] on the west [illegible] of Libanus, [illegible] south-east of Beiroot: [illegible] to have about 5000 inhabitants, partly [illegible] Christians. There are two Maronite [illegible] churches at Deir el Kamr. The [illegible] the Italian fashion, and is said to [illegible] country town of Italy. Captain [illegible] at work round one of [illegible] The emir resides at the palace or castle of [illegible] one hour's ride from Deir el Kamr: some of the apartments of the palace are described as very hand[illegible] with marble, and adorned with [illegible] the walls inlaid with ivory [illegible] passages of the Koran and [illegible] gilt characters, [illegible] The Reverend William J[illegible] in Syria, who visited B[illegible] is like a small town. [illegible] men of all trades, [illegible] blacksmiths, [illegible] Druses and Ch[illegible] and even Christian priests [illegible] emir, who is said to have [illegible] at one time a [illegible] to any religion [illegible] Druses or Christians [illegible] he was [illegible] in 18[illegible] having [illegible] he incurred the dis[illegible] in Egypt, but [illegible] of Mehemet Ali [illegible] occupation of S[illegible] Druses joined him at first; [illegible] with him: but peace [illegible] under him several [illegible] various districts of [illegible] Druses and others Maronites [illegible] armed and trained to the use [illegible] case of need the emir can collect [illegible] men; but this must be only [illegible] of bearing arms, as the Maronites [illegible] be more than 200,000, and [illegible] number. Dr. Hogg, in [illegible] and Damascus,' Lon[illegible] information concerning the Druses.

[illegible] Druses has been a subject of much [illegible] of mystery. The Rev. W[illegible] from the physician [illegible] accounts of former travellers. [illegible] three classes: the D[illegible] partially initiated, and [illegible] The second class are admitted [illegible] secret doctrine; they may [illegible] of Djahels, but must not [illegible] The third class, or adepts, [illegible] their places of meeting on Thursday [illegible] their rites, after all others have left [illegible] reveal what they know they would [illegible] death, which would also be [illegible] should turn Mussulman or Christian. [illegible] As to the nature of their secret doctrine, we have an account of it in De Sacy's 'Chrestomathie Arabe,' [illegible] but how far it can be relied upon [illegible] question with some, as it depends upon the authenticity of the books from which de Sacy has extracted. See also Adler's *Museum Cufico-Borgianum*, Rome, 17[illegible] Mr. Jowett saw MSS. shown about secretly, purporting to be the sacred books of the Druses, and a set of them was offered to him for the price of no less than 5000 dollars. It appears however pretty certain that the Druses are, or were originally, disciples of Hakem biamr Illa, the sixth Fatemite caliph of Egypt, who in the eleventh century proclaimed himself to be an incarnation of the Divinity, and who established a secret lodge at Cairo, divided into nine degrees, the last of which taught the superfluousness of all religion, the indifference of human actions, &c. (Von Hammer, *Geschichte der Assassinen*, 1818.) The Assassins themselves were a derivation of Hakem's sect, which was [illegible] an offshoot of the great schism of the Ismaelites, a remnant of whom still exists in Syria, in the mountains east of Tortosa, near their antient stronghold Maszyad. (J. F. Rousseau, *Mémoire sur les Ismaelites et les Nosaïris de Syrie*, with notes by de Sacy.) Hakem disappeared, probably by assassination, in one of his solitary walks near Cairo; his disciples expect his return, when he is to reign over the world. The Druses are said to believe in transmigration. The story of their worshipping a calf's head is variously told. (De Sacy, *Mémoire sur le culte que les Druses rendent à la figure d'un veau*, in the 2nd vol. of the *Mémoires de la classe d'Histoire et de Littérature Ancienne de l'Institut.*) They are also accused, like the Nosaïris, of licentious orgies in their secret meetings, and yet Mr. Jowett was told by Christian residents that as soon as a young Druse becomes initiated, he leaves his former licentious course of life and becomes quite an altered man, at least in appearance. Burckhardt observes on this subject that the Druses are more observant of outward decorum than of genuine morality. All agree however in saying that they are industrious, brave, and hospitable: their country is a land of refuge from Turkish oppression; they pay few taxes, as the emir has lands or domains belonging to him, from which he draws his chief revenue. Silk is the staple article for exportation, by way of Beiroot. The mulberry, the vine, the fig, and other fruit-trees, are reared in the lower ridges of the Libanus, while the higher range affords good pastures. Cotton is also cultivated and manufactured. The plains, especially the Bekaa, produce corn. There are a number of convents scattered about the mountains; there is a Maronite college for the study of Syriac at Aain el Warka, and another for the Melchite students at Deir el Mhalles. Burckhardt, who crossed the Libanus in different directions, gives the names of many towns or villages inhabited by Druses and Maronites, some of them considerable places, such as Hasbeya, with 700 houses; Zahle, in the Bekaa, with 900; Shirrei, near Tripoli, &c. The Druses dress differently from the Maronites: the men wear a coarse woollen beneesh, or cloak, black, with white stripes, thrown over a waistcoat, and loose breeches of the same stuff, tied round the waist by a sash of white or red linen with fringed ends; their turban is swelled out from the head into a shape resembling a turnip, and flat at the top. The women wear a coarse blue jacket and petticoat, without any stockings, and their hair plaited and hanging down in tails behind. When they dress they put on their head the Takeel, a hollow tube of silver or tin, from six to twelve inches high, shaped like a truncated cone, over which is thrown a white piece of linen, which completely envelops the body; they also wear silver bobs tied to their tresses. (Light's *Travels*.)

DRUSUS, CLAU'DIUS NERO, son of Tiberius Claudius Nero and of Livia, was born in the year 38 B.C., three months after his mother's marriage with Augustus. He served early in the army, and was sent in 17 B.C., with his brother Tiberius, against the Rhæti and Vindelici, who had made an irruption into Italy. He defeated the invaders, pursued them across the Alps, and reduced their country. Horace celebrated this victory in one of his finest Odes (lib. iv. 4). Drusus married Antonia Minor, daughter of Antony and Octavia, by whom he had Germanicus and Claudius, afterwards emperor, and Livia or Livilla. In 14 B.C., being sent to quell an insurrection in Gaul occasioned by the extortions of the Roman tax-gatherers, he succeeded by his conciliatory address. In the following year he attacked the Germans, and carrying the war beyond the Rhine, he obtained a series of victories over the Sicambri, Cherusci, Catti, and Tencteri, and advanced as far as the Visurgis, or Weser, for which the senate bestowed the surname of Germanicus upon him and his posterity. In 9 B.C. Drusus was made consul, with L. Quintius Crispinus. He was soon after sent again by Augustus against the Germans, crossed the Visurgis, and advanced as far as the Albis or Elbe. He imposed a moderate tribute on the Frisians, consisting of a certain quantity of hides, which, being afterwards aggravated by the extortion of his successors, caused a revolt under the reign of Tiberius. (Tacitus, *Ann.* iv. 72.) He caused a canal to be cut, for the purpose of uniting the Rhine to the Yssel, which was known long after by the name of Fossa Drusi; and he also began to raise dykes to prevent the inundations of the Rhine, which were completed by Paulinus Pompeius under the reign of Nero. Drusus did not cross the Albis, probably because he thought he had advanced already far enough: he retired towards the Rhine, but before he reached that river he died, at the age of thirty, in consequence, as it was reported, of his horse falling upon him and fracturing his leg. (Livy, *Epitome*.) Tiberius, who was sent for in haste, and found his brother expiring, accompanied his body to Rome, where his funeral was performed with the greatest solemnity. Both Augustus and Tiberius delivered orations in his praise. Drusus was much regretted both by the army and by the Romans in general, who had formed great expectations from his manly and generous sentiments. One of his grandsons, Drusus, son of Germanicus and of Agrippina, was starved to death by order of Tiberius, and Nero, the other, was put to death in the island of Ponza.


NERO CLAVDIVS DRVSVS GERMANICVS IMP
TI CLAVDIVS CAESAR AVG P M TR P IMP
S C

Coin of Drusus.

British Museum. Actual Size. Copper. Weight, 428¼ grains.

DRUSUS, the son of Tiberius by Vipsania, daughter of Agrippa, served with distinction in Pannonia and the Illyricum, and was consul with his father A.D. 21. In a quarrel he had with the favourite Sejanus, he gave him a blow in the face; Sejanus, in revenge, seduced his wife Livia or Livilla, daughter of Drusus the elder and of Antonia, and the guilty pair got rid of Drusus by poison, which was administered by the eunuch Lygdus. The crime remained a secret for eight years, when it was discovered after the death of Sejanus, and Livia was put to death. (Tacitus, *Annal.*)

DRYANDRA, a genus of Australian shrubs, with hard dry evergreen serrated leaves and compact cylindrical clusters of yellow flowers, seated upon a flat receptacle, and surrounded by a common imbricated involucre. It is in the latter respect that the genus principally differs from Banksia.

The species are much esteemed by cultivators for their beautiful evergreen leaves. They are commonly regarded as greenhouse plants, but will, in several cases, survive an English winter without injury, if protected by a glass roof in winter, and planted among rockwork high above the dampness of the level of the soil.

DRYDEN, JOHN, was born about the year 1631 or 1632[*].

Tradition gives Aldwinckle in Northamptonshire as his birth-place; but this much only is certain, that his father, Erasmus *Driden*, was the third son of Sir Erasmus Driden of Canons Ashby, in that county, who was created a baronet in 1619. The poet was educated at Westminster school under Dr. Busby, and came up as a Westminster scholar to Trinity College, Cambridge, May 11, 1650.

Almost the only notice which the college archives give respecting him is one dated July 19th, 1652, whereby he is 'put out of Commons for a fortnight at least,' confined to walls, and sentenced to read a confession of his crime at the fellows' table during dinner-time[†].

In 1654 his father's death put him in possession of an estate worth about 60*l.* per annum; he did not however leave Cambridge till three years afterwards, when he was introduced into a subordinate public office by his maternal relation Sir Gilbert Pickering. The stanzas on Cromwell's death, his first poem of any importance, were written in the following year, and in 1660 he signalized himself by 'Astræa Redux,' a congratulatory address on the Restoration.

It seems scarcely worth while attempting to excuse this change of views. Dryden was yet a young man, and had probably never before been in a situation to express his own opinions, apart from the influence of his kinsman; and after all, the lines on Cromwell contain, as Sir W. Scott has observed, little or nothing in the way of eulogy which his worst enemies could have denied him. In the year 1663 Dryden began his dramatic career with 'The Wild Gallant.' The plague and fire of London soon interrupted him for a time, and he employed himself upon his 'Essay on Dramatic Poesy,' a performance containing much elegant writing, and worthy of notice as the earliest regular work of the kind in our language. It would be easy to show the deficiencies and mistakes of this composition, but they are fully counterbalanced by that manly avowal—the first since the Restoration—of the supremacy of Shakspeare. About this time he married a daughter of the first Earl of Berkshire.

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[*] The monument in Westminster Abbey says 1632, but as it was not put up until twenty years after his death, the point is somewhat doubtful.

[†] What he could be doing in Cambridge during the long vacation is not so clear; but perhaps those on the foundation have, as now, always claimed the right of staying there.

On the revival of stage plays, he engaged to supply the King's Theatre with three plays a year, for the annual sum of 300*l.* to 400*l.* Malone has proved that the number really produced was far less than this, and did not amount to more than eighteen in sixteen years, while Shakspeare wrote, as is probable, two plays a year for several years, and Fletcher with assistance wrote more than thirty in ten years.

Towards the end of 1671, that celebrated attack on heroic dramas called the 'Rehearsal' was produced on the stage. Its effect, though sure, was not immediate; except that Dryden exchanged tragedy for comedy, and composed two comedies in 1672. A few years afterwards he took leave of rhyme; his last rhyming tragedy called 'Aureng-Zebe,' being brought out in 1675; but he continued to write for the stage until 1681, when the struggle between the parties of the Dukes of Monmouth and York seemed drawing to a crisis, and there appeared some need that the scurrilous abuse which had been in every way poured on the court party by means of epigram and satire should be rebutted in similar fashion.

This Dryden effected by the famous satire called 'Absalom and Achitophel,' wherein Monmouth figures as Absalom. Monmouth is treated with great levity, but all the vials of the poet's wrath are poured out on Buckingham, the author of the 'Rehearsal,' as Zimri, and on Shaftesbury as Achitophel. The last-named nobleman had been committed to the Tower, not long before, under a charge of high treason: he was however released upon the grand jury's refusal to find a true bill against him, which the Whig party celebrated by a medal struck for the occasion. This afforded Dryden a fresh subject, and in March, 1681, appeared 'The Medal,' a bitter lampoon on Shaftesbury, followed up in the next year by 'Mac Flecknoe,' and the second part of 'Absalom and Achitophel*,' which united gave the finishing stroke to his old enemies Settle and Shadwell, besides a numerous host of petty satirists. With Settle he had quarrelled some years before, whose chief supporter, Rochester having become implicated, and suspecting Dryden of indulging anonymous revenge, caused him to be attacked and beaten by bravos. This occurred in 1679.

During the four years from 1682 to 1685 Dryden produced nothing worth notice, with the exception of a translation of Maimbourg's 'History of the League,' undertaken, as Dr. Johnson says, to promote popery. We should be at a loss to account for this apparent want of purpose, but an event which occurred in the year last mentioned clears up the difficulty. Soon after the death of Charles II. Dryden turned Roman Catholic—not without due consideration—as the 'Religio Laici,' written nearly four years before, contains sufficient evidence of his mental struggles at that period, and not, it is to be hoped, otherwise than conscientiously, as indeed his subsequent conduct appears to show.

In 1690 Dryden returned to his old employment, and produced four plays between that year and 1694. This was no doubt owing to poverty, as the Revolution deprived him of the laureatship, which he had obtained on the death of Davenant in 1668, and the expenses of his family were now increasing. For the next three years he was busied in his translation of the Æneid, and about the same time with it appeared his celebrated ode on St. Cecilia's day†, which is perhaps one of the finest pieces of exact lyrical poetry which our language possesses, although not to be named with Wordsworth's Platonic ode.

In the middle of 1698 he undertook his adaptations of Chaucer, and about a year and a half afterwards completed his Fables. His last work,—a masque, with prologue and epilogue,—was written about three weeks before his death, which happened, after a short illness arising from neglected inflammation of the foot, May 1st, 1700. He was buried in Westminster Abbey, where a monument was erected to his memory by John duke of Buckingham. A portrait of him hangs in the hall of Trinity College, Cambridge.

It is extremely difficult to form an opinion on the character of a man of whose life we possess such scanty notice, and who, for the greater part of his literary career, wrote entirely to please others. Congreve has left a description of him, which, if it can be trusted, ensures for him the praise of modesty, self-respect, true-heartedness, and a forgiving spirit. His manners are said to have been easy without forwardness; but there seems little doubt that his powers of conversation were rather limited. It does not seem necessary that we should attribute his extreme indelicacy as a writer to corresponding coarseness or impurity as a man.

The close connexion which existed between the Cavaliers and the court of France had tended much to vitiate the taste of those who were the received judges of literary merit. To the Italian sources, whence Spenser and Milton drew, was preferred the French school; and the consequences are as apparent in the grossness of Dryden's comedies as in the stilts and extravagance of his heroic drama*. Perhaps no nation ever had so little national poetry as the French; whence the extreme worthlessness of that school in England which professed to imitate them. But of all French poetry the heroic drama, from which Dryden copied, is perhaps least worth imitation. The characters are not real, neither are they such as we should wish to see existing. They excite our surprise without engaging our sympathies. Poems such as Boileau's are only the legitimate offspring of a very artificial age. We may be astounded at the flattery which characterizes his 'Discours au Roi,' or amused at the bigotry of his 'Ode on the English;' but there is much pleasing versification to compensate for these defects. The same may be said of Pope in our own country; he will always find admirers: but who ever reads Dryden's plays? Those who deny to Pope the name even of *poet* will allow him to be an amusing and at times an instructive writer; but the heroic drama can serve to no end either of amusement or instruction. There is another class of poets, whose influence revived for a short time after the Restoration, those whom Dr. Johnson has with no reason at all called the metaphysical poets; and one of Dryden's chief excellencies is, that he soon saw reason to desert their bombastic absurdities for a more chaste style; although the fashion of the day, which he alternately led and followed, obliged him occasionally to make use of expressions such as his better taste must have disowned. He appears to have been very late in discovering that style for which he was most fitted, namely, satire, in which he has never been surpassed, and rarely equalled. His translations of Virgil and Juvenal deserve very high praise, particularly when they are compared with the style of translation usual in his time. In his version of Chaucer he has not been so successful. That substitution of *general* for *particular* images which characterizes the performance is always a step away from poetry. Perhaps the most striking instance of the superiority of Chaucer is that description of the Temple of Mars which occurs towards the close of the second book of 'Palamon and Arcite' in Dryden, and a little past the middle of Chaucer's 'Knighte's Tale.' This passage is also curious as an instance of Dryden's hatred of the clergy; he introduces two lines to convert Chaucer's 'smiler with the knife under the cloak' into a priest.

Dryden's prose works consist mostly of dedications, the extravagant flattery of which is only palliated by custom. His 'Essay on Dramatic Poesy' has been already noticed. He also wrote Lives of Polybius, Lucian, and Plutarch (*Biog. Brit.*), and assisted in translating the last-named author: perhaps, however, only from the French.

Dr. Samuel Johnson has been highly praised for his critique on Dryden. He has not, however, escaped that spirit of verbal criticism which was so prevalent in his days; and his comparison of our poet with Pope shows how little competent he was to do more than judge of the externals of poetry. Sir Walter Scott's life of Dryden is a beautiful piece of critical biography, uniting research only equalled by Malone's to taste and style of an order far surpassing Johnson's.

(Langbaine's *Dramatic Poets*; Johnson's, Malone's, and Scott's *Lives of Dryden*; *Quarterly Review for* 1826; *Edinburgh Review*, 1808; *Biographia Britannica*; *Life of Sir W. Scott*, vol. ii.)

DRYOBA'LANOPS, a genus established by the younger Gærtner, from specimens of the fruit found in the Banksian collection, supposed by him to belong to the tree which yielded the best cinnamon. But Mr. Colebrook, from specimens sent to Dr. Roxburgh, which in the absence of the latter he received, ascertained that the fruit belonged to camphor-tree of Sumatra, which he accordingly named *Dryobalanops camphora*, 'until its identity with D. aromatica (of Gærtner) be established.' (*Asiat. Researches*, xii.) Dr. Roxburgh had, in his MS. Flora Indica, already named it Shorea camphorifera. Some botanists are of opinion that the genus is not sufficiently distinguished from DIPTEROCARPUS, but Blume, the latest author, and one who has had the fullest opportunity of examining the subject, has, in the article on *Dipterocarpeæ*, in his 'Flora Javæ' given it as his opinion that Dryobalanops should be kept distinct; as, like Shorea, it has all five instead of only two of its sepals prolonged into long foliaceous wings, while its cotyledons are unequal and rumpled.

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* Partly written by Tate.

† This was the second on that subject. The first he wrote in 1687.

* It should be observed that Spain was the birthplace of that form of comedy which Dryden derived immediately from France.

According to Blume, the existence of this camphor-yielding tree was first indicated by Grimm in *Ephem. Nat. Cur.* Kæmpfer was so well acquainted with its distinctness, that in describing the Camphor-tree of Japan (*Laurus Camphora*), he says, 'that natural camphor, of crystal-like appearance, which is scarce and of great value, is furnished by a tree of Borneo and Sumatra, which is not of the Laurel genus.' The first notice of the tree is in the 4th volume of the *Asiatic Researches*, where we learn that a tree near Tappanooly on the west coast of Sumatra yielded above 3 pounds of camphor, and at the same time near 2 gallons of camphor oil; that the tree resembles the bay in leaves, is fond of a rich red loam tending to a blackish clay, and that it grows principally on the north-west coast of Sumatra, from the Line to 3° of north lat. The fullest account is given by Mr. Prince, resident of Tappanooly, who describes the tree as growing spontaneously in the forests, and as being found in abundance from the back of Ayer Bongey as far north as Bacongan, a distance of 250 miles: he says that it may be classed among the tallest and largest trees that grow on this coast; several within daily view measuring 6 or 7 feet in diameter. But it will produce camphor when only 2½ feet in diameter. The same tree which yields the oil would produce camphor if unmolested, the oil being supposed to be the first state of the secretion, which ultimately changes into concrete camphor, as it occupies the same cavities in the trunk which the camphor afterwards fills: consequently it is found in young trees. The produce of camphor of a middling-sized tree is about eleven pounds, and of a large one double that quantity. (*Fl. Ind.* ii. p. 616.) As stated in the article CAMPHOR, this kind of camphor is very highly esteemed by the Chinese. It is commonly called Malay Camphor, or Camphor of Barus, from the port of Sumatra whence it is mostly shipped. Its price in China is 100 times greater than that of the common camphor of commerce. (M'Culloch's *Com. Dic.*) In the same work it is mentioned that camphor oil being nearly as cheap as spirits of turpentine, might perhaps be profitably imported into England as a substitute for that article or for medicinal use.

Camphor, which in many respects resembles the essential oils, has been shown by Dumas to be an oxide of hydrocarbon identical in composition with pure oil of turpentine; hence the term *camphene* has been applied to it. But Dr. Thomson informs us that its camphor oil differs in some respects from camphene, as he was not able to produce camphor with the same facility or in equal quantity by driving a stream of oxygen gas through highly rectified oil of turpentine, which Dumas regards as *pure* camphene.

DRY ROT, a well-known disease affecting timber, and particularly the oak employed for naval purposes. When dry rot is produced by the attacks of fungi, the first sign of it consists in the appearance of small white points, from which a filamentous substance radiates parallel with the surface of the timber. This is the first stage of growth of the seeds of the fungus, and the filamentous matter is their thallus or spawn. As the thallus gathers strength it insinuates its filaments into any crevice of the wood, and they, being of excessive fineness, readily pass down and between the tubes from which the wood is organized, forcing them asunder, and completely destroying the cohesion of the tissue. When the thalli of many fungi interlace, the radiating appearance can no longer be remarked; but a thick tough leathery white stratum is formed wherever there is room for its development, and from this a fresh supply of the destructive filamentous thallus is emitted with such constantly increasing rapidity and force, that the total ruin of timber speedily ensues where circumstances are favourable for the growth of the fungi.

It is generally stated that dry rot consists of the thallus of Merulius lacrymans, or Polyporus destructor, two highly-organized fungi, whose fructification is sometimes found upon rotten timber. But it is a great mistake to suppose that dry rot belongs exclusively to those two species, or that they are even the common origin of it; on the contrary, there is reason to believe that any of the fungi that are commonly found upon decaying trees in woods are capable of producing dry rot, and it is quite certain that one of the most rapidly-spreading and dangerous kinds is caused by the ravages of different species of Sporotrichum. The latter throw up from their thallus whole forests of microscopic branches loaded with reproductive spores, of such excessive smallness that they may insinuate themselves into the most minute crevices or flaws even in the sides of the tubes of which timber consists, and they are infinitely more dangerous than Merulii or Polypori, which seldom fructify. It is the genus Sporotrichum that at the present moment is causing the dry rot in ships under repair at Sheerness.

The circumstances that are most favourable to the development of the dry rot fungi are damp, unventilated situations, and a subacid state of the wood. The latter condition, especially in oak, is easily produced by a slight fermentation of the sap which remains in the timber, especially if the latter has not been well seasoned before being employed. It has been proved experimentally that fluids which, in their ordinary state, will not produce fungi generate them abundantly if ever so slightly acidulated. Dutrochet found that distilled water holding in solution a small quantity of white of egg will not generate fungi in a twelvemonth, but upon the addition of the minutest quantity of nitric, sulphuric, muriatic, phosphoric, oxalic, or acetic acids, it generated them in eight days' time in abundance. Alkalescent infusions possess the same property. This observer also found that the only poisons which will prevent the appearance of fungi are the oxides or salts of mercury. A solution of fish-glue yields fungi rapidly and in great abundance; but a small quantity of red precipitate or corrosive sublimate destroys this power entirely. It is moreover an important fact that no other mineral preparation has any such properties. Dutrochet ascertained that other metallic oxides acted differently. Oxides of lead and tin hastened the development of fungi; those of iron, antimony, and zinc, were inert; and oxides of copper, nickel, and cobalt, although they retarded the appearance of fungi, yet did not prevent their growth in the end. These facts confirm in a striking manner the statement of Mr. Kyan, as to the impossibility of timber, steeped in a solution of corrosive sublimate, becoming a prey to dry rot, so far as dry rot is produced by a fungus.

Of ANIMAL DRY ROT, that is, of death caused in animals by the attack of fungi, little was was known till lately, and great doubt was entertained respecting its existence. And yet, if the subject is rightly considered, there is nothing improbable in its occurrence: it is well known that living vegetable matter is subject to the ravages of fungi, as in all the cases of mildew, smut, rust, &c., with which the farmer is familiar, and therefore there is no intelligible reason why living animal matter should be exempted from the same fate. Specimens of hymenopterous insects resembling wasps have been brought from the West Indies, with a fungus allied to Sphæria militaris growing from between their anterior coxæ, and it is positively asserted by travellers that the insects fly about while burthened with the plant. Upon opening the bodies of the wasps they are found filled with the thallus of the fungus up to the orbits of the eyes and the points of the tarsi; the whole of the intestines being obliterated. In such cases it is to be supposed that the thallus of the sphæria first kills the wasp by compressing and drying up the body, and then, continuing to grow, occupies the whole of the cavity of the shell of the insect. A more common instance of animal dry rot is the disease in silk worms called La Muscadine. Silk-worms of all ages are occasionally liable to become sickly and to die, soon after death becoming stiff, and acquiring such a degree of firmness as to be readily broken. They then throw out from their surface a sort of white efflorescence, which is the fructification of the fungus called Botrytis Bassiana, their inside being filled by the thallus of the same plant. If some healthy caterpillars are placed beneath a bell-glass, along with a small portion of worm killed by the Botrytis, they soon catch the disease, exhibit the same symptoms as those already mentioned, and eventually perish; having, no doubt, been infected either by rubbing themselves against the dead worm, or, which is more probable, having received upon their skins the infinitely minute seeds dispersed by the Botrytis. If healthy crysalids are inoculated by the introduction below their shell of a little of the Botrytis matter upon the point of a needle, they also sicken and die.

In these cases effects are produced upon insects similar to those upon timber; that is to say, vitality in the one case and cohesion in the other is destroyed by the growth of the thallus of certain fungi, which spread with great and irresistible rapidity, and fructify where occasion offers.

DSHIKKETEI (*Zikketei*). Cuvier writes the word *Dzigguetai*, and Buffon *Dzigithai*, the native name for the *Eques Hemionus* of Pallas, *Asinus Hemionus* of Gray. [HORSE.]

DUAL NUMBER. The Greek, Sanscrit, and Gothic of antient, and the Lithuanian of modern languages, in addition to the undefined plural which they share with other tongues, possess also forms of the verb and noun in which *two* persons or things are denoted, called the dual number. On a careful consideration of the suffixes which are supposed to convey this notion, there seems reason for believing that the idea of duality was not originally contained in them, but simply that of unlimited plurality.

The suffix of plurality which belongs to the Indo-Teutonic languages seems to have had two forms, *en* and *es*, as in the English *housen* and *houses*. Thus the Greeks had two forms for the first person plural of their verbs active, *tuptomen* and *tuptomes*. In the second person, the Latin language gives the suffix *tis*, *scribitis*; probably the Greek, in its oldest character, would have presented us with a suffix *tes*, but the forms of that language which have come down to us give only the abbreviated *te*, *tuptete*. But if there existed a double form for the second person as well as for the first, we should in that case have also *tupteten*, or rather *tupteton*, seeing that to the Greek ear *ton* was a more familiar termination. In the third person the dual *ton* might well represent a plural, as the oldest form of that person in the singular gives a suffix *ti*, *esti*; and this, with the plural termination *n*, would produce a syllable which might readily take the same shape as the second person dual.

In the nouns the same analogy prevails. The nominatives and genitives of the dual and plural differ no more than might be expected in two dialects; in the dative, the difference consists in the one number having a final *n*, the other an *s*; while the accusative dual has lost the final sigma, a fate common enough with that letter in the Greek language, as may be seen even in the plural nominatives, *mousai*, *logoi*, which the analogy of the other declensions proves to have once possessed that letter. We have already seen an example of the same loss in the second person plural of the verb. In the pronouns, again, the same confusion of the two numbers prevails. Thus the Greek dual of the pronoun *I* contains the very same element, *no*, which in the Latin is appropriated to the plural.

In the Gothic verb the same principle may be traced. A specimen may be seen in the second person dual which has the suffix *ts*, a form more closely approaching the old plural suffix *tis*, which has been above mentioned, than even the *th*, which is the suffix of the same person in the plural.

Again in the Lithuanian, while the first person plural of the verb, which ends in *ma*, has derived that suffix from the older form *mus* or *mes*, the dual of the same person ends in *wa*, which has a strong resemblance to our plural *we*. The same observation applies to the Sanscrit verb of the Parasmaipadam form of the potential and imperative moods, and of the preterits called by Bopp 'Præteritum augmentatum uniforme et multiforme.' The terminations of the first persons of the dual and plural respectively in the present of the Parasmaipadam are *was* and *mas*; of the second and third persons dual respectively, *thas* and *tas*; and of the second person plural, *tha*.

If it be admitted then that the dual in its origin was not confined to the notion of two, it remains to consider how that notion was superadded. Perhaps the following may t be an unreasonable conjecture. In many countries re are two or more dialects co-existing, one among the cated and in towns, the other belonging more particu- y to the cottage. In the places of public meeting, ther for religious or political purposes, the dialect which pens to belong to the more educated class will prevail, while the other, as genuine, though not so fortunate a dialect, will still maintain its ground by the fireside. The former will be addressed to hundreds, the latter commonly to one or two individuals. Hence the colloquial and friendly dialect of the cottage may well be borrowed by even the public speaker when speaking of two persons; and thus the notion of duality which at first was only accidentally united with a certain suffix becomes in the end the inseparable and essential meaning thereof. Something parallel to this may be seen in the double forms of the English verb *to be*. While *am*, *art*, *is*, are honoured by the favour of the learned, the unlearned still retain, and with as good a title, the genuine forms *be*, *best*, *bes* or *be*. These are both indicatives, yet it is already a common practice to look upon the latter set of forms as constituting a subjunctive.

An interesting discussion by William Humboldt on the dual is printed in the Transactions of the Academy of Sciences of Berlin for the year 1827 (*Abhandlungen der historisch-philologischen Klasse* der Königlichen Academie der Wissenschaften zu Berlin, aus dem Jahr 1827,) page 161-187), to which we refer our readers, though the views explained in that essay differ from those in the present article.

DUBLIN, an archbishopric of Ireland, including the dioceses of Dublin, Kildare, Ferns, Leighlin, and Ossory and extending over the counties of Dublin, Wicklow, Wexford, Kilkenny, Carlow, Kildare, Queen's County, with the exception of one parish, and part of King's County. By act 3rd & 4th William IV., c. 37, sec. 46, so soon as the archiepiscopal see of Cashel becomes void, the jurisdiction of the archbishopric of Cashel is to be vested in the archbishop of Dublin for the time being.

In 1834 the total population of this province was 1,247,290; of whom there were 177,930 members of the Established Church; 1,063,681 Roman Catholics; 2,517 Presbyterians, and 3,162 other Protestant Dissenters; being in the proportion of rather more than 13 Roman Catholics to 3 Protestants of whatever denomination. In the same year there were in this province 1612 daily schools, educating 108,474 young persons; being in the proportion of $8\frac{70}{100}$ per cent. of the entire population under daily instruction, in which respect Dublin stands second among the four ecclesiastical provinces of Ireland. Of these schools there were in the same year 204 in connection with the National Board of Education.

DUBLIN, a bishop's see in the ecclesiastical province of Dublin. The chapter consists of dean, precentor, chancellor, treasurer, two archdeacons, and nineteen prebendaries. The collegiate chapter of Christ Church, in Dublin, consists of dean, precentor, chancellor, treasurer, archdeacon, and three prebendaries: this deanery has heretofore been held in commendam with the bishopric of Kildare. By 3rd & 4th William IV., cap. 37, sec. 50, the deanery of Christ Church, when next void, is to be united as to spiritualities, with the deanery of St. Patrick; and the temporalities, as portion of the revenue of the see of Kildare, are to be vested in the ecclesiastical commissioners.

This see comprehends the county of Dublin, the greater part of the county of Wicklow, parts of Carlow and Kildare and some small portions of King's and Queen's Counties. In 1834 it contained 178 parishes, constituting 95 benefices in which there were 124 churches of the Establishment, [illegible] other places of worship in connection therewith, 121 Roman Catholic ditto, 7 Presbyterian ditto, and 27 other places of Protestant worship. The gross population in the same year was 501,977; of whom there were 106,599 members of the Established Church, 391,006 Roman Catholics, [illegible] Presbyterians, and 2082 other Protestant Dissenters, being in the proportion of rather more than seven Roman Catholics to two Protestants of whatever denomination. In the same year there were in this diocese 509 daily schools, educating 37,219 young persons; being in the proportion of $7\frac{28}{100}$ per cent. of the entire population under daily instruction, in which respect this diocese is much inferior to the province at large, and ranks on a par with the see of [illegible] nineteenth among the 32 dioceses of Ireland. Of the above schools, 62 were in the year 1834 in connection with the National Board of Education.

There is no certain mention of the see till the [illegible] century. In the year 1152 it was erected into an archbishopric in the person of bishop Gregory; and in [illegible] it was united with the see of Glendaloch, which had been founded in the sixth century. The archbishops of Dublin did not, however, obtain full possession till the year 1479. The union of the sees of Dublin and Glendaloch still subsists.

The first Protestant archbishop of Dublin was George Browne, who had been an Augustinian friar of London. The present (1837) archbishop is Dr. Whateley. The archiepiscopal residences are St. Sepulchre's, now disused, and converted to a police barrack; at Tallaght, where archbishop Hoadley repaired the old mansion in 1729; and in Stephen's Green, in Dublin.

DUBLIN, a county in the province of Leinster in Ireland; bounded on the north-west and north by the county of Meath; on the east by the Irish channel; on the south by the county of Wicklow; and on the south-west by the county of Kildare. Greatest length from Gormanstown on the north to Bray upon the south, 25 Irish, or 31¾ English miles. Greatest breadth from the promontory of Howth upon the east to the boundary of Kildare at Leixlip on the west, 15 Irish, or 18¾ English miles. The coast line from Bray to the point of junction with Meath is about 55 Irish, or 70 English miles. Until the publication of the Ordnance Survey Map of Dublin, the area cannot be stated with certainty. It is given by Dr. Beaufort at 228,211 statute acres, or 355 square statute miles, including the county of the city of Dublin. According to the more accurate survey made for the grand jury in 1821, by Mr. Duncan, the superficial contents are, arable 132,042 acres; not arable 16,191 do. Total, exclusive of county of city, 148,233 acres. Exclusive of the county of the city of Dublin, the population in 1831 was 176,012.

The county of Dublin, excepting a small tract on the south, is a champaign country highly cultivated. The only portions of the county not under cultivation are the promontory of Howth, and the range of mountains which separates Dublin from Wicklow on the south. The Dublin mountains, of which the central group has an average height of 1000 or 1200 feet, are partially separated from the loftier elevations of the county of Wicklow by the valley of Glencullen on the east, and by that of Ballynascorney or Glenismael on the west; a neck of elevated land, intervening between these valleys, connects the advanced range with the group of Kippure and Seechon on the south. The elevation of Kippure, part of which is in the county of Dublin, is upwards of 2700 feet. The whole range forms a fine mountain back-ground to the rich scenery of the plain of Dublin.

The northern part of Dublin county is more undulating than the immediate vicinity of the capital. A low range of cultivated eminences, called the Man-of-War Hills, extends across the line of communication with Meath and Louth, and the ground on the north-western border next Meath and Kildare is pretty much broken by picturesque valleys. The only marked eminences, however, north of the mountainous tract, are the islands of Lambay and Ireland's Eye, and the hill of Howth. The isthmus which connects Howth with the mainland is a low narrow neck, which gives Howth very much the appearance of an island. The highest point of the promontory of Howth is 567 feet above the level of the sea. The cliffs towards the bay and channel are lofty, and the whole promontory contributes much to the picturesque effect of Dublin bay.

The principal creeks north of the bay of Dublin are those of Baldoyle, Malahide, and Rogerstown; but these tide-harbours are of little commercial advantage. The only tolerable harbour north of Howth is that of Balbriggan. The town of Balbriggan, which in 1831 contained 3016 inhabitants, has taken its rise almost solely in consequence of the construction of a pier here by the late Baron Hamilton, who received 1500*l.* towards this work from the Irish parliament in 1761, and a further sum of 3752*l.* for the same purpose in 1765. The total cost is stated at upwards of 15,000*l.* The quay is about 600 feet in length, and is frequently occupied with craft; but it would still require a large expenditure to make it complete for vessels of the second class. From 80 to 100 cargoes of coal are annually delivered here, besides rock-salt, bark, slates, &c. There is an excellent light-house on the pier-head, built by the Ballast Board. Four miles south from Balbriggan is Skerries, the chief fishing village on the east coast of Ireland, with a pier for small craft 450 long, built in 1755.

South of Skerries the sandy shore gives place to a limestone cliff as far as the creek of Loch Shinney, another site well adapted for the construction of a harbour. One mile south from Loch Shinney is Rush, a considerable village, with a small pier for fishing boats. Off the creek of Malahide is the rocky island of Lambay. In 1821 the population was only thirty-four. There is good anchorage all round the island in five to eight fathoms water, clear ground; it has also a small pier and harbour. The Muldowny bank lying off the creek of Malahide is a good artificial oyster bed. The peninsula of Howth contains about 1500 acres, and excepting towards the low isthmus which connects it with the mainland, stands in deep water. The sound between Howth and Ireland's Eye, a rocky picturesque island of thirty acres, which lies about three quarters of a mile off the northern side of the promontory, being a sheltered situation with considerable depth of water, was selected by government in 1807 for an asylum and packet harbour; but unfortunately this object has not been accomplished. The work, which was completed under the direction of the late Mr. Rennie, consists of two piers, of which that on the east is 2493 feet in length, and that on the west 2020 do. On the extremity of the eastern pier is a lighthouse. The entrance between the extremities of the piers is 300 feet across; and the space enclosed 52 English acres. The whole work is faced with cut granite, except the sloping glacis under water which is of red grit from Runcorn in Cheshire. The entire amount expended on Howth harbour from the 2nd July, 1807, to 5th January, 1832, was 420,472*l.* 8*s.* 5½*d.* The deepest and best anchorage afforded by the sound is left outside the piers; one-half of the space enclosed is dry at half-ebb, and two-thirds at low-water; and the sands from the bank on the west side are daily accumulating in the entrance; so that the mail packets for want of water in the basin have been latterly transferred to the Kingstown station. From Howth round to the sands of the North Bull the whole of the promontory which stands in deep water is rocky and precipitous towards the sea. On a detached rock at the south-eastern extremity, called the Bailey, stands a lighthouse, which marks the northern entrance to the bay of Dublin. Another lighthouse now disused stands on the brow of the promontory above, a little to the north.

From the Bailey of Howth to the island of Dalkey at the opposite extremity of the bay of Dublin, is a distance of 6¾ English miles. Between these points the bay recedes in a semi-elliptical sweep to a depth of about six miles inland. The shore surrounding the head of the bay, where the Liffey, Tolka, and Dodder rivers empty themselves, is low: it rises, however, towards Blackrock and Kingstown, and beyond the latter town is of a very bold and picturesque character. The river of Bray, which discharges itself about half a mile north of the bold promontory of Brayhead, is the county boundary.

As a harbour, the bay of Dublin is materially encumbered by a great tract of sand, which is bisected by the Liffey in a direction from west to east. The portion on the north of the Liffey is called the North Bull, and that on the south the South Bull. In order to protect the navigation of the Liffey from the sands of the South Bull, a pier consisting of a mound of gravel contained between double stone walls was undertaken by the Irish government in 1748. It runs from the suburb of Ringsend along the northern margin of the South Bull, to a distance of 7938 feet. Here the main work at first terminated in a basin and packet station, called the Pigeon-house; and the remainder of the channel, extending 9816 feet from the Pigeon-house to the north-eastern extremity of the Bull, was protected by a range of frame-work and piles. The expense however of keeping this part of the wall in repair was found so heavy, that in 1761 a light-house was commenced at the extremity of the Bull, and from it the wall was carried inwards towards the Pigeon-house until completed in 1796. This sea-wall is composed of two parallel walls of hewn granite, alternate headers and stretchers, laid without cement. The space between is filled to a certain height with gravel and shingle; over which is a course of stone-work imbedded in cement; and the whole is finished on the top with a course of granite blocks of large dimension, laid in tarrass. The wall is thirty-two feet broad at bottom, and twenty-eight at top. The Pigeon-house, since being disused as a packet station, has been converted into a strong depôt for artillery and military stores. The amount of parliamentary aid given to the construction of the south wall from 1753 to 1780, was 57,169*l.* 4*s.* 6*d.* Another wall, running nearly south-east from the opposite shore of Clontarf, is intended in like manner to confine the sands of the North Bull, and to scour the channel. This, which is called the north wall, has been constructed by the Ballast Board of Dublin, and cost from 1819 to 1824 a sum of 103,054*l.* 19*s.* 11*d.* Notwithstanding these great undertakings, the navigation of the Liffey is still very imperfect, and requires constant dredging. The bar, on which there are but five feet of water at spring-ebbs, runs across the channel immediately outside the lighthouse.

The insecurity of the bay, joined to the failure of the works at Howth, led to the commencement of the present noble asylum harbour of Kingstown, on the site of the old harbour of Dunleary, on the south side of the bay, in 1817. The small pier and tide harbour at Dunleary have been enclosed within the new works, and are now crossed by the Dublin and Kingstown railroad. The new harbour is entirely artificial, consisting of an area of about 200 acres contained between two piers, of great dimension. There is a depth of 24 feet at the pier-head, at the lowest springs, which is sufficient for a frigate of 36 guns, or an Indiaman of 800 tons. The work was commenced under the authority of two acts of the 55th and 56th George III.; the latter of which grants certain duties on all vessels entering the port of Dublin, to be vested in commissioners for carrying the work into execution.

The Liffey has a course of little more than eight miles from the point where it enters Dublin county to the bay of Dublin at Ringsend. It is navigable for vessels of 200 tons to the Custom-house, and for barges and row-boats to Chapel Izod, about two miles farther up. The Dodder, the course of which lies almost wholly within this county, takes its rise from numerous small streams descending from Kippure mountain, and forming a rapid stream which descends in a course of about ten miles into the bay of Dublin at Ringsend. The Tolka is a small river rising near Dunbryna in the county of Meath; it flows east by south, through Blanchardstown and Glassnevin to the north-western extremity of Dublin bay, which it enters by Ballybough bridge.

The Royal Canal running west by north from its chief terminus at Broad-stone on the north-west of the city of Dublin, unites the capital with the Upper Shannon at Richmond harbour in the county of Longford. A short branch encircling the north-east of the city connects the basin at Broad-stone with docks opening into the Liffey east of the Custom-house. The width of the line throughout, at top is 42 feet, and at the bottom 24 feet, with locks, and a depth of water calculated for boats of from 80 to 100 tons. The entire length of the canal from the Liffey to the Shannon is 91 English miles. Loch Ouil, in Westmeath, supplies the summit level, which is at a height of 307 feet above high-water mark in the Liffey docks. The supply of water to the northern part of the capital is drawn from the Royal Canal. The canal is the property of a company of subscribers which was incorporated by royal charter in 1789.

The chief terminus of the Grand Canal, the most important line of water-carriage in Ireland, is at James's Street Harbour, on the south-west of the city, from which it crosses the counties of Dublin, Kildare, and King's County, in a direction west by south to the Shannon at Shannon Harbour, about two miles north of Banagher. The summit level commencing at 17 Irish miles from Dublin, is 261 feet 10 inches above the tide-water in the Liffey. This level is supplied by the Middletown and Blackwood rivers, which are branches of the Barrow; and is ascended from James's Street Harbour by four double and fourteen single locks. The total length from the western extremity of the capital is 79 English miles. From the summit level, at a distance of 20¼ Irish miles from Dublin, a branch of similar dimensions with the main trunk descends 103 feet half an inch in 22¼ Irish or 28¼ English miles, through two double and nine single locks, by Rathangan and Monasterevan to the navigable river Barrow at Athy. The dimensions throughout are, at the top, 45 feet; at the bottom, 25 feet; the depth of water, 6 feet in the body of the canal, and 5 feet on the sills of the lock-gates. The locks are generally 70 feet long, 14 wide, and calculated to pass boats of 60 tons in from two and a half to five minutes.

The Grand Canal has a second terminus in an extensive range of docks covering an area of 25 English acres on the south side of the Liffey near Ringsend. The communication with the river is by three sea locks, and the basins within are capable of containing 600 sail in 16 feet of water. Attached are three graving-docks for vessels of different dimensions, with several extensive piles of stores; the whole being surrounded by spacious wharfs. This portion of the works has failed in a remarkable manner. The stores have long been unoccupied, and the wharfs are for the most part overgrown with grass.

The Dublin and Kingston railway passes the western dock by a viaduct and raised causeway, and a factory for the repair and supply of locomotive engines is being erected by the proprietors of the railway on the southern side of the same basin. The communication between the Grand Canal docks and the line from James's Street harbour is by a branch canal of about three miles, running from the docks round the south-east and south of the city. The canal is now the property of a company which was incorporated in the year 1772, and who are stated to have spent from time to time on these works a sum of a million and a half sterling. The supply of water for the southern part of the capital is drawn chiefly from the canal.

The main roads subject to turnpikes, which issue from Dublin, are those to Howth, Malahide, Drogheda by Swords, and the Naul, Drogheda by Ashbourn, Ratoath, Navan, and Mullingar, Carlow by Rathcoole and Tallaght. The chief lines free from toll are the military road and the roads to Enniskerry, Bray, and Kingstown.

The only railway at present completed in Ireland is that between Dublin and Kingstown in this county. It is the property of a company incorporated by 1st & 2nd William IV., c. 69, with a capital stock of 200,000*l.*, in shares of 100*l.* each. The line extends from Westland Row, in Dublin, to the jetty opposite the main street of Kingstown, called the Forty-foot road, a distance of nearly six English miles.

The entire line is lighted with gas. The railway bed consists of layers of gravel and concrete, with numerous cross drains. The sleepers are massive blocks of granite, which it was supposed would give unusual solidity to the structure, but the want of elasticity in these supports causes the engines to work harshly. The railway was opened for traffic on the 17th of December, 1834, between which day and the 1st of March, 1836, the number of passengers carried was 1,237,800, being, on the average, [illegible] persons daily. Since that period the number of passengers had increased considerably, as appeared by the following statement for the year 1836 of the number of passengers conveyed by the Dublin and Kingstown Railway:—May, 119,000; June, 119,080; July, 146,000; August, 139,000; total, 523,000.

The cost of constructing the railroad and stations, locomotive engines, carriages, &c., and the expenses of obtaining the act of incorporation, amounted, on the 1st of March 1836, to 237,000*l.*, or upwards of 40,000*l.* per mile, exclusive of 972 yards since added. Of this sum, 75,000*l.* has been advanced as a loan by Government. At the same period the company had realized a net profit of 11,517*l.*, yielding about 8 per cent. per annum on the capital paid by the shareholders.

By act 6th and 7th William IV., c. 132, a company was incorporated for the purpose of making a railway from Dublin to Drogheda. At present the only incorporated railway companies in Ireland are those above mentioned and the Cave-hill and Ulster Railway Companies. [Dublin.]

The climate of Dublin is temperate; frosts rarely continue more than a few days, and snow seldom lies. The heaviest fall of snow on record is that which commenced on the [illegible] of January, 1814, and continued undissolved till the beginning of the next April. The prevailing winds are from the west. The average proportion of winds, as stated by Rutty, is west, south-west, and north-west, to east, south-east, and north-east, as 9061 to 5141. Of 68 storms noted by Rutty, 57 were from the south-west, and but two from the east or north-east. The easterly and north-easterly winds which prevail in spring not being broken by any high grounds, are violent and ungenial. On an average of forty-one years there were in this county—of springs, 6 wet, 22 dry, [illegible] variable; of summers, 20 wet, 16 dry, 5 variable; of autumns, 11 wet, 11 dry, 19 variable. It also appears from a mean of observations that the dry days in Dublin are to the rainy as 110 to 265. The quantity of rain is, however, by no means as great as at Cork or Belfast. In 1792, one of the wettest years on record, the depth of rain which fell in Dublin was 30.7 inches; of this 6.8 inches fell in the month of August. The average annual depth of rain which fell in Dublin during the sixteen years preceding the year 1817, was 23 inches 7 lines.

The greater part of the county of Dublin is occupied by a tract of mountain limestone, being a part of the central limestone field of Ireland, which extends from the Atlantic to the Irish sea. This secondary tract extends into Meath on the north, and is bounded in this county on the south by primary rocks. Along the northern coast also there are patches of primitive rock, as the greenstone and argillaceous schists, which form the Man-of-war Hills and the island of Lambay, and the stratified quartz and schist of Howth. Lambay consists of strata of argillaceous schist and greenstone porphyry. The schistose strata are much indurated and contorted. In Howth the stratification is very obvious, and the schistose beds exhibit a great diversity of hues from purple to red. Some of the strata rest on their edges, others are undulated, and sometimes curved upon themselves so as to resemble the concentric crusts of some spheroidal formation (Dr. Scouler). The primitive formation on the south of the limestone plain consists of a ridge of granite supporting flanks of micaceous and argillaceous schists. The granite extends on the south from Dalkey island to Blackrock, and from thence to Dundrum and Rathfarnham; it then takes a southerly direction and crosses the range of the Dublin mountains by the line of the military road; whence, crossing the northern extremity of Glenismael, it extends into the group of the Kippure mountains. On the south it runs from Dalkey to the hill of Killiney, and thence inland by Rochestown hill to the Scalp, whence, holding a southerly course, it passes on to Glencree, in the county of Wicklow, and so southward to a distance of nearly sixty miles, forming the nucleus of the entire range from Killiney to Blackstairs mountain, between the counties of Carlow and Wexford. The granite comprising the greater part of this range is of a coarse texture, and easily disintegrated; in Glenismael particularly, it is frequently found decomposed to a depth of several feet, and hence probably the uniform outline presented by the summits of the range. At Dalkey, however, and generally along the eastern and north-eastern limits of the granite district, the stone quarried is of the closest grain, and excellently adapted to all purposes of building. It is here free from hornblende; the felspar is of a pearly whiteness, and in the stone obtained from the quarries of Kilkenny the mica, instead of occurring in plates, is found in the form of plumose mica.

This mass of granite is almost everywhere in contact with the micaceous schist, both on its western and eastern flanks; and the junction of the rocks may be observed at Killiney, the Scalp, and Rathfarnham. The argillaceous schist approaches it very closely at Ballynascorney; and between Blackrock and Dundrum the edges of the limestone field are in several places within a few yards of the granite, the intervening rocks of the series not being observable. The limestone which elsewhere possesses the usual character of carboniferous limestone, is extremely compact along the margin of the field towards the primitive series, and has a schistose structure (the Calp of Kirwan), which renders it highly useful as a material for building. Dolomite, or magnesian limestone, occurs near the junction of the primary and secondary strata, at Sutton on Howth. Magnesian limestone also occurs on the Dodder, near Milltown. It dresses with peculiar sharpness under the hammer or chisel, and is the material of some beautiful specimens of building; among others, of the Lord-Lieutenant's chapel in the castle of Dublin.

The only mines at present worked (and that but partially, in the county of Dublin, are the lead mines at Ballycorus) within half a mile of the Scalp. Galena, potters' clay, and manganese have been found on Howth. Fuller's earth of a middling quality has been found at Castleknock, on the north bank of the Liffey.

The soil of Dublin abounds in mineral springs: of those within the city, ten were analysed about the year 1750: they are all saline purgative springs, and some of them so strongly impregnated as to yield on evaporation from three to four hundred grains of salts per gallon: of some of those salts two drachms operated as a brisk cathartic. In 1758 a spring strongly impregnated with sulphureted hydrogen gas was discovered in the vicinity of a disused chalybeate spa at Lucan, on the south bank of the Liffey. These waters have been found very efficacious in cutaneous diseases. There are tepid springs near Finglass and Leixlip; the heat is 75½ degrees Fahr. In general the water, which rises from the Calp district around Dublin, is impregnated with a considerable portion of sulphate or nitrate of lime, which renders it unfit for most domestic purposes, unless with the use of large quantities of soda. It deposits a copious sediment on the vessels in which it is used; and in one distillery mentioned by Whitelaw an incrustation of sienite, half an inch in thickness, had frequently to be cleared from the inside of the boilers.

The vegetable soil of the county of Dublin is generally shallow. On the granite bottom it is a light gravel, which requires strong manuring. The subsoil of the Calp district is a tenacious clay, which retains the water and renders the loamy soil wet and cold; but drainage and an unlimited supply of scavengers' manure from the city have brought that part of this district, which lies immediately round the capital, into a good state of productiveness. The quality of the land improves towards the west and north, and the district bordering on Meath is not inferior to the generality of wheat lands in the midland counties. The soil along the junction of the northern primary strata and the limestone is also of excellent quality. There is but a small proportion of the county under tillage. Villas, gardens, dairy farms, kitchen gardens, and nurseries occupy the immediate neighbourhood of the capital, and grazing farms and meadow lands extend over the country which is not occupied by demesnes, to a distance of ten and twelve miles beyond those on the west and north. The mode of feeding generally pursued is grazing during summer and hay feeding in winter. Many extensive farmers and resident proprietors however pursue the system of green crops and stall-feeding the year round. The total annual value of the agricultural produce of the county of Dublin has been estimated at 1,145,800*l.*; the rental of proprietors at 343,700*l.* per annum, and the rent paid by them at 3*l.* per acre. The rents paid by land-occupiers vary from 4*l.* and 4*l.* 10*s.* to 10*l.* in the vicinity of the capital.

Dublin County is divided into nine baronies; namely:—I. Balrothery on the north, containing the towns of Balbriggan, population in 1831, 3016; Skerries, population 2,556; Rush, population 2144. II. Nethercross, scattered through the other baronies in seven separate divisions, of which six lie north of the city of Dublin, containing the towns of Swords, population 2537; Lusk, population 925; and Finglass, population 840. III. Coolock, on the north-east of the city of Dublin, containing the towns of Clontarf, population 1309; Baldoyle, population 1009; Howth, population 797; and Glassnevin, population 559. IV. Castleknock, on the north-west of the city of Dublin, containing part of the town of Chapel Izod, total population 1632. V. Newcastle, on the west and south-west of the city of Dublin, containing the towns of Lucan, population 1229; Rathfarnham, population 1572; Crumlin, population 544; and Newcastle, population 3915. VI. Donore, a small barony, embracing a portion of the south-west of the city of Dublin, with a population of 11,153. VII. St. Sepulchre's, a small barony embracing a portion of the south of the city of Dublin, with a population of 13,631. VIII. Uppercross, on the south-west of the city of Dublin, containing the towns of Ranelagh (a suburb of Dublin), population 1999; Rathmines (do.), population 1600; Harold's-cross, population 1101; Milltown, population 673; Rathcoole, population 602; Clondalkin, population 756; Dalkey, population 544; and Ballymore Eustace, in the detached portion of the county, population 841. IX. Half Rathdown, on the south-east of the city of Dublin, containing the towns of Kingstown, population 5756; Blackrock, population 2029; Little Bray, population 1168; Stillorgan, population 650; and Dundrum, population 680.

There is not at present in the county of Dublin any town exercising corporate privileges. Swords and Newcastle each returned two members to the Irish parliament. The county of Dublin, the city of Dublin, and the university of Dublin are each at present represented by two members in the imperial parliament.

The commerce of the county of Dublin, exclusive of the capital and its immediate vicinity, is limited to the small coast-trade carried on at Balbriggan, Bray, and the other coast towns. The cotton and stocking manufactures are carried on at Balbriggan with considerable spirit. There are two cotton factories, and numerous establishments for stocking weaving; the Balbriggan hosiery has long held a high character in the market. Considerable quantities of flour are manufactured in this county. The principal corn-mills are on the Liffey, the Balbriggan river, and the Kimmage brook, on the south-west of Harold's-cross.

In 1835 the number of boats belonging to the county of Dublin, which were employed in the fisheries, was as follows:—

Decked vessels, 121; tonnage, 4651; men, 789:—half-decked vessels, 27; tonnage, 265; men, 150:—open sail-boats, 66; men, 297:—row-boats, 65; men, 249; number of fishermen, 1505.

The fishing grounds lie in from 15 to 60 fathoms water between the Dublin coast and the Isle of Man. The fish consist chiefly of turbot, brit, sole, and plaice, which are sent to market daily throughout the year. There is a well-known fishing ground between Rush and Lambay Island, on which cod, ling, haddock, whiting, &c., are taken. Trawling is the mode of fishing generally practised by the decked and half-decked boats. White trout and salmon are taken at the bars of the Bray river and Liffey. Since the withdrawal of bounties the fisheries along the coast, as well as elsewhere in Ireland, have declined.

Table of Population. (Exclusive of the County of the City of Dublin.)

Date.	How ascertained.	Houses.	Families.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total.
1792	Estimated by Dr. Beaufort .	10,760	..	..	..	..	..	..	54,000
1813	Under Act of 1812 . . .	16,633*	..	..	..	..	..	..	110,4[illegible]*
1821	Under Act 55 Geo. III. c. 20	20,791	33,695	..	..	..	71,661	78,350	150,011
1831	Under Act 1 Wm. IV. c. 19 .	23,819	31,570	10,127	8,769	12,674	82,299	93,713	176,012

* Return incomplete.

The census of 1831, as compared with that of 1821, exhibits an increase of population and houses, and a decrease in the number of families, which, if not arising from some error in the returns, is very remarkable.

The civil history of the county of Dublin is immediately connected with that of the capital. The whole of the fee of the county, with the exception of the estates of the St. Lawrence family, and with the exception, to some extent, of the estates of the families of Barnwall, Lutterel, and Talbot of Malahide, has frequently changed hands since the period of the Reformation. The forfeitures consequent on the rebellion of 1641 extended to 67,142 acres, 2 roods, 26 perches, profitable, and 1666 acres unprofitable, in this county. The amount of forfeitures in the county of Dublin, consequent on the war of the Revolution in 1688, was 34,536 acres profitable, of the then annual value of 16,061*l.* 16*s.*, and of the then total estimated value of 208,796*l.* 18*s.* The families which chiefly suffered by these confiscations were those of Barnwall, Fleming, Plunket, Walsh, Peppard, Archbold, Cruise, Fagan, Hackett, Archer, Sweetman, Dowdall, and Trant.

The Pagan antiquities of the county of Dublin are not numerous. There is a cromlech on the hill of Carrickmoor in Howth. Another cromlech stands to the south of Killiney, on the descent into the vale of Shanganagh; and at Brennanstown, on the Bray road, 6½ miles from Dublin, there is a third, of large dimensions. Dublin is, however, rich in ecclesiastical and military antiquities. The round tower of Clondalkin, 4½ miles from Dublin, on the southern road by Rathcoole, is in better preservation than most other similar edifices in Ireland. The door is at a height of 15 ft. from the ground; the entire height of the tower is 84 ft., and its diameter above the basement 15 ft. The explosion of 260 barrels of gunpowder in the powder-mills in the vicinity, in 1797, did not in the slightest degree injure the round tower. The antiquities at Swords, on the great northern road, 7 miles from Dublin, consist of a palace of the archbishops of Dublin, in ruins, a square steeple of the old church, and a round tower, 73 ft. in height. This tower is also in good preservation, and retains its conical stone capping. At Lusk, on the same road, 4 miles farther north, there is an antient church with a square steeple, attached to three of the angles of which are round towers with graduated parapets, and at the remaining angle a round tower of greater altitude and superior construction, supposed to be the original building. Between Swords and Baldoyle, 5 miles from the capital, is the hamlet of St. Doulagh's, containing one of the most singular stone-roofed churches in Ireland. The entire edifice measured but 48 ft. by 18 ft. It is divided into a rude nave and choir, which communicate by a narrow square-headed doorway, not sufficiently high to admit a full-grown person upright. The entire construction is rude and capricious; the building does not stand due east and west. Some of the arches are together nondescript in their shape, and for several of the recesses and nooks between the roof it is difficult to assign any probable use. It is perhaps the only edifice in the empire which exhibits the square-headed doorway, the Saxon arch, and the trefoil Gothic and lancet windows in such close juxtaposition. Near the church is a consecrated well, inclosed in an octagon building, the interior of which retains some paintings in fresco executed in the beginning of the seventeenth century. In the vicinity of Howth Castle are the ruins of St. Fintan's Church and of the collegiate church and abbey of Howth. On the opposite side of the Bay of Dublin the vicinity of Dalkey exhibits the remains of an antient town erected here at an early period for the protection of the shipping and merchandize of the capital, to which the creek of Bullock served for a length of time as port. There are also some druidical remains on the commons of Dalkey. The castles of Clontarf, Baldongan, Naul, and Castleknock are among the principal detached military edifices.

In 1821 the number of young persons in the schools of this county, exclusive of the county of the city of Dublin, was 9442, being nearly in the proportion of 6 per cent. of the entire population under instruction. The proportion of young persons under daily instruction in the diocese of Dublin, in 1834, was 7.28 per cent., in which respect the diocese, which may be taken as an index of the county, ranks nineteenth among the thirty-two dioceses of Ireland.

The grand jury presentments for the county of Dublin average about 18,000*l.* per annum. The circumstance of so many of the roads in the county being under the control of turnpike-trustees renders this assessment comparatively light in proportion to the extent of the district on which it is levied.

The constabulary force of the county, on the 1st of January, 1836, consisted of 1 stipendiary magistrate, 5 chief constables of the first class, 1 do. of the second class, [illegible] constables, 113 sub-constables, and 6 horse. The expense of maintaining this force for the year 1835 was 6129*l.* 16*s.* [illegible], of which 2890*l.* 7*s.* 2*d.* was chargeable against the county. The county of Dublin, together with the county of the city of Dublin, the county of the town of Drogheda and the counties of Meath, Louth, and Wicklow, contribute, in proportion to their relative populations, to the support of the Richmond Lunatic Asylum, built in Dublin in 1[illegible]. The fever hospitals and dispensaries throughout the county are supported by equal voluntary contributions and grand jury presentments.

A survey of the county of Dublin, on a scale of 3 inches to the mile, was made by order of the grand jury in 1[illegible]. A survey on a scale of not quite 6 inches to 3 English miles, had been published in 1760 by John Rocque. A chart of Dublin, by Seale and Richards, was published in 1765, and another has since been published by Captain Bligh. An interesting account of the chief localities of this county is contained in Brewer's 'Beauties of Ireland,' London, 1[illegible]. The 'Statistical Survey of Dublin County,' published by the Royal Dublin Society in 1801, is extremely meagre; and there is not at present any published work on the topography or statistics of the county at all adequate to the importance of the subject. A 'History of the Archbishops of Dublin,' comprising a topographical and statistical survey of the county, by Mr. D'Alton, a writer of considerable reputation, has been stated to be ready for the press, but is not yet published.

DUBLIN, the chief city of Ireland, forming by itself a county of a city, on both sides of the river Liffey, at its entrance into the bay of Dublin. Lat. of Dublin Castle 53° 20′ 38½″ N.; long. 6° 17′ 29″ W. The situation, as considered with reference to the whole of the United Kingdom, is central, there being more places of importance in Great Britain and Ireland accessible in a given time from Dublin than from either London or Edinburgh.

With regard to its boundaries, Dublin may be considered either as a county of a city with separate corporate jurisdiction; or as a city having a local police, and returning representatives to parliament; or as a city consisting of a collection of continuous buildings. In each character its boundaries are different.

Pending the publication of the Ordnance Survey map of Dublin, the areas contained in these various limits cannot be accurately stated. The map constructed by order of the grand jury of the county of the city in 1821 gives the area contained within the limits of corporate jurisdiction at 5217 Irish or 8450 statute acres; the Report of the Boundary Commissioners states that of the city, as limited for the purposes of the elective franchise, at 3538 statute acres; and the Rev. Mr. Whitelaw in 1805 estimated the entire area then occupied by buildings at 1264 statute acres.

Dublin appears to have been known by something approaching nearly to its present name in the second century, as it is found written Eblana in the geography of Ptolemy. The name is written in historical documents Dublin, Dyflin, Dyvelin, &c., being all varieties of the Irish *Dubh-linn*, or *Black-pool*, which appears to be the true etymology. It is also called, and is still generally known among the Irish, by the name *Ath-cliath*, which may be rendered *Hurdle-ford*, from the causeway laid on hurdles which formerly led to the channel of the river across the ooze at either side.

In the various political contests that have afflicted Ireland from the earliest history of the country Dublin has always borne a conspicuous part; but these events belong rather to the general history than to that of the city. [IRELAND.] Dublin, however, under all circumstances, continued to maintain and increase its importance and its extent. In 1205 the castle was ordered to be built and the city to be fortified; and in 1215 a stone bridge was built over the Liffey. In 1316 the first material extension of Dublin took place in consequence of the pulling down of some of the old walls, and the erection of a new line of defence by the citizens when threatened with a siege by Edward Bruce. The Reformation had commenced in Dublin, in 1535, by the consecration of George Brown, a denier of the papal supremacy, to the archbishopric. In 1550, on Easter Sunday, the liturgy was read in English, for the first time, in Christ Church, and printed, the next year, by Humphrey Powell: this is supposed to have been the first book printed in Ireland. The foundation of the great Protestant University of Trinity College followed close on the establishment of the Reformation. In consideration of the leading part it had taken at the Restoration, the city of Dublin was honoured by the king with a collar of S S., and the mayor was soon after (1665) invested with the title of Lord Mayor, together with an estate of 500*l.* per annum towards maintaining that dignity. After the struggles immediately preceding and following the Revolution of 1688, on the settlement of affairs by the public cancelling of all the arbitrary proceedings of the abdicated government, October 2, 1695, the improvement of the city was resumed, and from this till the period of the Union the increase of Dublin proceeded with great rapidity.

Although Dublin has decidedly fallen off as an emporium of trade and a centre of society since the act of Union removed the seat of legislation to London, it has, during the last period, not only increased in size and population to a great extent, but continues to advance in architectural improvement.

Stephen's Green, Merrion, Rutland and Mountjoy squares, with almost all the streets on the north-east of the river, were built round during the period between the middle of the 18th century and the Union. Fitzwilliam-square and the adjoining streets, which are at present among the most fashionable places of residence in Dublin, have been completed since, and a great extension has taken place in private residences towards the south-east; a considerable portion of the north-east of the city also belongs to this period.

The use of brick and stone in private buildings was not general until after the Restoration; and there are now few or no remains of private dwellings of so early a date. The walls almost entirely disappeared in the extension of the city in the 18th century. Christ Church and St. Patrick's are the chief objects of antiquarian interest. The Castle, although occupying a very antient site, contains but a small portion of the original building. The Tholsel and old courts of law have disappeared, and the oldest of the bridges now standing is Barrack Bridge, occupying the site of a wooden bridge built so late as 1671.

The corporation of Dublin consists of the Lord Mayor, two Sheriffs, 24 Aldermen, and 144 Common Councilmen, made up of 48 Sheriffs' Peers and 96 Representatives of the Guilds. There are 25 Guilds, of which Trinity Guild, or the Guild of Merchants, is the most important, returning 31 of the 96 representatives of the whole. The number of freemen is not correctly ascertained, but is supposed to be about 4000. The chief officers of the corporation are the recorder, coroners, president of the court of conscience, and the governors and keepers of the several prisons. This corporation is subject to the New Rules of the 25th Charles II., modified by the provisions of the 33rd George II., c. 16. The corporation has for upwards of two centuries maintained a strict Protestant character; and the exclusion of numerous wealthy merchants of the Roman Catholic religion, or of what are termed liberal principles, has rendered it comparatively inefficient as a municipal body.

The jurisdiction of the corporate magistrates of the county of the city extends over the various liberties within the Circular Road, although these are situated within the county of Dublin. They are not however permitted to sit at sessions of the peace for the county. The court of quarter sessions of the peace for the county of the city, at which the recorder, lord mayor, and two aldermen preside, has, by the 48th George III., c. 140, a criminal jurisdiction extended to all crimes and offences, excepting high-treason, committed on or within the Circular Road; and by its sittings and adjournments affords 12 gaol deliveries each year. The trial of serious offences is generally reserved for the commission court for the county of the city, held before two judges of the superior courts, with whom the lord mayor is joined in commission. The lord mayor holds a weekly court for the determination of small claims of wages, and the infliction of fines for infringement of municipal regulations: the operation of this court is not considered efficient.

The chief civil jurisdiction of the corporation is exercised in the lord mayor and sheriffs' court, which is held once every three months, with a cognizance of all actions for sums exceeding 40*s.* late Irish currency. The recorder's civil bill court for the recovery of debts over 40*s.* is held quarterly. The court of conscience, for the determining cases between party and party, under 40*s.* Irish, sits every day from 10 o'clock A.M. The practice of these courts is considered open to much improvement, particularly in the adjustment of fees, and the remuneration of certain officers by fixed salaries.

The gaol of the county of the city is Newgate, which is also the gaol for that part of the county of Dublin within the Circular Road. It was founded in 1773, and is situated in Green-street, beside the City Sessions'-house, on the north-west of the city. Contiguous to Newgate is the Sheriffs' prison for debtors, erected in 1794. The City Marshalsea is a small prison for debtors committed from the lord mayor's court and court of conscience; the condition of this prison is very wretched. The Smithfield Penitentiary, erected at the charge of government, is a house of correction for the reception of convicted offenders of both sexes; this prison is well conducted. The males are employed and instructed in weaving; the females in needlework, and in washing for the Sheriffs' prison and the gaol of Newgate. The Richmond Bridewell, another government establishment, is also a house of correction for male and female convicts. Weaving is the principal employment of the males; those sentenced to hard labour are put to the tread-mill. The prisoners on being discharged are paid one-third of the earnings of their labour. The condition of this bridewell is highly creditable to the authorities. The current expenses of these establishments are defrayed by presentments of the grand jury of the county of the city, and in the year 1833 the gross outlay was 11,763*l.* Besides these, there is the House of Industry, with lunatic asylum, hospitals, &c. attached, which is supported by an annual grant of 20,000*l.* from government.

The Four Courts Marshalsea prison is situated within the city, but is not connected with the corporation. The county gaol of Kilmainham stands beyond the western suburbs, and is one of the most severe places of confinement in Ireland.

The revenues of the corporation arise chiefly from rents, certain dues on shipping for slippage and anchorage, renewal of leases, fines levied by the city authorities, and pipe-water taxes. The rents arise out of four several estates granted to the city at various times.

The gross amount of revenue and loan received by the corporation in the year commencing 29th September, 1833, was 38,346*l.* 13*s.* 2½*d.*, being equal to the expenditure of the year. The principal item in the expenditure is interest on bond, which amounts to upwards of 14,000*l.* per annum.

The police of Dublin and the surrounding district is regulated by the 48th George III. c. 140, amended by the 5th George IV. c. 102. By these Acts the castle of Dublin, and all places within eight Irish miles thereof, not being within the jurisdiction of the Court of Admiralty, are united into one district, and this district is divided into four divisions. Each of these divisions embraces about a quarter of the city, and extends over the adjoining district to the exterior limit of the jurisdiction. To each is attached a divisional office of police, with an establishment consisting of one barrister, one alderman, and one member of the common council, being the divisional justices for that district. The Castle district is the seat of the head police-officer, to whom the divisional justices of the other districts make weekly reports.

The funds applicable to the expense of the police and watch establishments are derived from various sources, namely, from the watch-tax, from pawnbrokers' licences, from publicans' and other licences, from fines and fees, and from government grants. The total disbursements of the Dublin police establishment for the year ending 31st March, 1834, was 41,548*l.* 3*s.* 6¼*d.*

The paving, cleansing, and lighting of the city of Dublin are regulated by the 47th George III. (loc. and pers. sess. 2, c. 109), amended by the 54th George III. (loc. and pers. c. 221). The Paving Board is a corporation, and consists of three commissioners appointed by the lord-lieutenant. They derive their income from various assessments and other receipts. The total amount of the receipts of the commissioners for paving, &c., for the year ending 5th January, 1833, was 41,115*l.* 8*s.* 6*d.*; and the total amount of their expenditure was 41,997*l.* 7*s.* 5*d.* The streets in general are Macadamized, the footpaths for the most part flagged, and the curb-stones and crossings of cut granite. The city has been well lighted since 1825 with gas, for the supply of which there are four incorporated companies, the works at three of which are at present in operation.

The supply of water is regulated by a committee of the corporation, entitled the Committee of the Pipe-water Establishment. The pipe-water rent, collected by the corporation, forms a large item in their income.

The commissioners of wide streets are constituted by various Acts of Parliament, of which the earliest is the 31st George III. c. 19, and the latest the 2nd George IV. c. 110. The board consists of twenty-five; the lord mayor and representatives of the city and county for the time being are members. Their funds, since the coal-duty ceased in March, 1832, arise almost solely from the wide-street tax, which produces from 5000*l.* to 5500*l.* per annum; and this is allocated to pay the interest, at 3 per cent., on a loan of 36,895*l.* 6*s.* 5*d.* from the government.

The port and harbour are under the management of the Ballast Board, constituted by 26th George III. c. 19. Their funds arise from taxes on shipping entering the port. The tonnage duties received by the Ballast Board in 1832 amounted to 11,960*l.* 17*s.* 9*d.* In the same year the expenditure of the Ballast Board on the harbour was 7,4[illegible]*l.* 11*s.* 10*d.*, and on the great north wall 160*l.* 13*s.* 5*d.* Upwards of 4000*l.* per annum of the receipts of the board goes to pay the interest on debt.

The supply of fuel is almost wholly by colliers from the opposite coast of England. The colliers which entered the port in 1832 measured 230,878 tons. Turf is retailed for lighting fires, &c., in which mode considerable quantities are used: the supply is furnished from the extensive bogs of Kildare and Westmeath by the boats of the Grand and Royal canals.

The ground on which Dublin stands rises gently from the river towards the north and south-west: the highest ground in the city is at Broadstone harbour, which is 62 feet above the level of high water in the Liffey. The eastern division on the south of the river lies almost wholly without the limits of the antient city on level ground, the northern part of which has in a great measure been reclaimed from the former bed of the Liffey. Six extensive plots of open ground ornament and ventilate this portion of the city, viz., on the south, the Coburg Gardens and Fitzwilliam-square; on the east, Merrion-square; on the north, the park of Trinity College; on the west, the Castle Gardens; and in the centre, Stephen's Green. Dame-street, which leads from the castle to the university, expands towards its eastern extremity into College Green, from which all the leading lines of communication radiate.

The whole area of College Green on the east is occupied by the front of Trinity College, a rich and dignified pile of building of the Corinthian order, built in 1759, and extending north and south 300 feet, a little in advance of the provost's house, which stands on the eastern side of the entrance into Grafton-street.

Separated from the college by the entrance into Westmoreland and College streets, stands the Bank of Ireland, formerly the Irish house of parliament, founded in 17[illegible], which presents a portico of six Corinthian columns towards College-street, and a semicircular façade with a receding centre of extraordinary magnificence towards College Green. The effect of this combination of grand architectural objects is peculiarly striking. West from College Green, Dame-street consists of uniform and lofty houses, occupied by persons in trade, having the Commercial Buildings, founded in 1796, about midway on the north, and the Royal Exchange, founded in 1769, at its southern extremity.

Of the squares which lie east and south of College Green, Stephen's Green, laid down in 1670, is the first in point of extent as well in Dublin as in the United Kingdom. The area within the railing is a rectangle of 1220 by 970 feet, being somewhat more than 27 statute acres, and is now handsomely laid out, although so late as the year 18[illegible] it was a marshy flat surrounded with a stagnant ditch and mean wall. The surrounding buildings are, however, very unequal.

The eastern division of the city lying north of the Liffey occupies higher ground, and is the airiest and most cheerful part of Dublin. Mountjoy-square and Rutland-square occupy the crest of the hill, and from these respectively the chief lines of communication are Gardiner's-street and Sackville-street, the first leading to the Liffey at the Custom House, the latter to Carlisle Bridge, Westmoreland-street, and College Green. The façade of the Lying-in Hospital and Rotunda Rooms forms a striking termination to Sackville-street on the south.

From Rutland-square Sackville-street extends with a scarcely perceptible descent to Carlisle Bridge, a distance of three-quarters of an English mile. The breadth throughout is 40 yards, and the buildings on each side lofty, and, with few exceptions, uniform. About midway between Carlisle Bridge and the Rotunda stands a fluted Doric column, on a pedestal of large proportions, bearing a colossal statue of Lord Nelson. This monument was erected in 1808. West of Nelson's monument the General Post-Office presents a cut-granite front of 223 ft. to the street. In the centre is a portico of Portland stone.

At the southern extremity of Gardiner-street the Custom-house occupies a detached plot of ground on the quay leading from Carlisle Bridge to the north wall. This splendid building, founded in 1781, is 375 ft. in length by 205 ft. in depth, and exhibits four decorated fronts of the Doric work; the columns, &c., being of Portland stone and the body of the building of cut granite. To the east of the Custom-house are docks and stores, the latter on a very extensive scale, surrounded by a lofty wall. The business of the Custom-house department is however so trifling, that half the accommodation here provided would be amply sufficient.

Between Gardiner and Sackville streets runs Marlborough-street, parallel to each. On the western side of Marlborough-street, about midway between its extremities, stands the Roman Catholic Metropolitan Church, founded in 1816. St. George's Church, the beautiful spire of which is conspicuous from the bay and many parts of the city, occupies the highest ground in this district. It is the most expensive of the modern churches of Dublin, from a design by Johnston, and cost 70,000l.

The western division of the city, north of the river, is not intersected by any street of large proportions, and is almost exclusively occupied by dealers, tradesmen, and labourers. The portion of it which lies along the quays and towards the Blue Coat Hospital is however well built and respectably inhabited. The Four Courts, situated on King's Inn Quay in this district, was commenced in 1786, and is a building of great extent and splendour. Westward from the courts of law, the Royal Barracks occupy an elevated site near the river at the extremity of the city on this side. On the outskirts of this division of the city, from the Royal Barracks northward, are the Blue Coat Hospital, founded in 1773; the Richmond Bridewell and Penitentiary, and the House of Industry and hospitals attached; the Linen Hall, opened in 1728; and the King's Inns. In the eastern part of the district, near Capel-street, are Newgate, the sheriffs' prison, and the Sessions House for the county of the city.

West of the Royal Barracks is the entrance into the Phœnix Park, a finely-wooded demesne of 1089 Irish or 1759 English acres, containing the vice-regal lodge, and the lodges of the chief and under secretary; the Zoological Society's gardens and establishment; the Royal Military Infirmary; the Hibernian Society's school for the education of the children of soldiers; a powder magazine and artillery station; and a grand obelisk, erected in commemoration of the victories of the Duke of Wellington. The park was first enclosed and laid down for the recreation of the citizens in the reign of Charles II., and was completed by the Earl of Chesterfield while Lord Lieutenant of Ireland. The greater portion of the lands belonged to the dissolved priory of Kilmainham.

The division of Dublin which lies west from the Castle, on the south side of the Liffey, is the oldest part of the city, and is now almost exclusively occupied by persons in trade, small dealers, and the labouring classes. The Castle of Dublin, at the north-eastern extremity of this district, consists of two handsome quadrangles, surrounded, except on one side, by the apartments of state and the offices of government.

West of the Castle stands Christ's Church Cathedral, a venerable cruciform structure, part of which is of a date anterior to the coming of the English. South from Christ Church, at a distance of rather more than a quarter of a mile, is the Cathedral of St. Patrick, situated at the foot of the declivity, the ridge of which is occupied by the rival and older cathedral. St. Patrick's is an imposing pile, consisting of nave, transepts, and choir, with a chapter-house at the east end. Attached is the ancient archiepiscopal palace, now converted to a police barrack, and the deanery house, a commodious residence built in the last century. At the back of the old palace is the library founded by Archbishop Marsh in 1694. On the south of this division are a penitentiary, the Portobello barracks, and several hospitals; and on the west, towards Island Bridge, three extensive establishments,—the Royal Hospital of Kilmainham, built at the cost of the army in 1684; the Foundling Hospital; Swift's hospital for lunatics; Stephens's hospital; Kilmainham gaol and the county court-house; and the artillery barracks at Island Bridge.

The Liffey is quayed in throughout its entire length, and crossed by eight bridges, five of which are executed in cut stone, and two in metal. These quays give a great air of magnificence to the views up and down the river.

The condition of the poorer classes in Dublin is wretched in the extreme; yet there are few cities in which charitable institutions are more numerous or better supported. The number of persons totally destitute is estimated at 25,000; of labouring persons who, getting only occasional employment, are frequently in a destitute state, at 15,000; and of poor tradesmen, frequently in the same condition from want of employment and other causes, at 11,000.

The principal charitable institutions of Dublin are the following:—Association for the suppression of Mendicity; Society for the relief of Sick and Indigent Room-keepers; the Strangers' Friend Society; the Benevolent Strangers' Friend Society; the Charitable Association; Society for the Relief of the Industrious Poor; Sir Patrick Dun's Hospital; Meath Hospital and County Infirmary; Jervis-street Infirmary; Mercers' Hospital; Maison de Santé (these five are general hospitals for the poor); Simpson's Hospital (for blind and gouty poor); Lying-in Hospital; Steevens's Hospital (general); Cork-street Fever Hospital; Whitworth Fever Hospital; City of Dublin Hospital (general); United Hospital of St. Mark and St. Ann (general); Hospital for Incurables; Westmoreland Lock Hospital; Hospital of the House of Industry; Lunatic Asylum of the House of Industry; Swift's Hospital (for lunatics). For these charities the total amount of [illegible] is 13,862l. 15s. 4d., and the parliamentary and grand jury grants are 26,280l.

In addition to these institutions there are six minor lying-in hospitals in the city, numerous houses of refuge and female penitentiaries, and about twelve dispensaries supported by voluntary contributions and local assessment. The number of out-door patients so relieved is very great, probably not less than 50,000 per annum.

The total number of charitable schools in the city of Dublin is 190. Of these 139 are day-schools, 34 are schools where the scholars are lodged, boarded, clothed, &c., 27 are schools for orphans, or in connexion with orphan societies, 4 are schools belonging to societies, and 2 are daily model-schools of the National Board of Education. The total number receiving instruction at these schools is 15,737; the total annual expenditure is about 37,100l.

The trade of Dublin consists chiefly in the supply of the midland districts with articles of import. The silk manufacture has long been carried on with considerable success in the production of a superior article, but the trade has latterly declined, and is now very languid. The woollen manufacture was also carried on with good success, but has likewise fallen off of late years. The firm of Messrs. Willans continue to manufacture broadcloths, but this is almost the only house in the trade. The printing of calicoes and muslins has been brought to great perfection by Mr. David Henry, of Island-bridge.

That part of the trade of Dublin which is carried on with the ports of Great Britain has greatly increased since the general adoption of steam-vessels, but there are no means for distinguishing its amount, the intercourse between the two islands having been placed upon the footing of a coasting trade. The vessels that entered the port from foreign countries during each of the five years from 1832 to 1836, and the amount of their tonnage were as follows:—

	British.		Foreign.		Total.	
	Ships	Tons	Ships	Tons	Ships	Tons
1832	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1833	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1834	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1835	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1836	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

A large proportion of the foreign trade is carried on through Liverpool and Bristol by means of steam-vessels, which convey goods to those ports for shipment.

The amount of customs' duties collected in Dublin in the four years from 1833 to 1836 was:

1833 . .	£653,764
1834 . .	758,632
1835 . .	918,881
1836 . .	908,630

The tonnage of commodities conveyed upon the Grand Canal and the Royal Canal to and from Dublin exceeds 350,000 tons per annum. The greater part of that which is conveyed to Dublin consists of agricultural produce, cattle, and turf. From Dublin are sent building materials, coals, salt, manure, and general merchandise.

The intercourse between England and Dublin has been much encouraged by the establishment of steam-packets. The number of passengers conveyed by the post-office packets alone, between Dublin and Holyhead and Liverpool, in each of the three years, 1833 to 1835, was as follows:—

	Between Dublin and Holyhead.	Between Dublin and Liverpool.	Total.
1833	9,189	9,292	18,481
1834	11,564	12,425	23,989
1835	11,558	14,040	25,598

The population of Dublin has been vaguely ascertained from time to time as follows:—

A.D.	Houses.	Inhabitants.
1644	No return	8,159
1777	17,151	137,208
1788	14,327	114,616
1798	16,401	172,084
1803	15,958	109,528
1804	16,234	172,042
1813	15,104	176,610

and with great precision in 1821 and 1831; viz.—

	1821.		1831.	
	Houses.	Population	Houses.	Population
County of the city of Dublin, as limited by its antient boundary	14,029	178,603	16,042	204,155
Dublin inside the Circular Road	18,116	224,317	No return.	232,362
Dublin inside and outside the Circular Road and canals	18,567	227,335	No return.	265,316

The classification of the population of the county of the city in the latter year was as follows:—Males, 91,557; females, 112,598; males 20 years of age, 50,234; occupiers employing labourers, 14; do. not employing do., 26; labourers employed in agriculture, 508; employed in manufacture and making manufacturing machinery, 155; employed in retail trade or in handicraft, as masters or workmen, 23,576; capitalists, bankers, professional, and other educated men, 8620; labourers employed in labour not agricultural, 10,820; other males 20 years of age (except servants), 3612; male servants 20 years of age, 2903; do. under 20 years of age, 556; Female servants, 11,572.

The university of Dublin is incorporated as 'the College of the Holy and undivided Trinity near Dublin, founded by the most serene Queen Elizabeth.' The collegiate body consists of a provost, seven senior fellows, one of whom is vice-provost, eighteen junior fellows, seventy scholars, and thirty sizars. The number of students at present on the books is about 2000. The permanent income of the university arises out of landed estates, which produce a rent of 13,846*l.* 2*s.* per annum, exclusive of the provost's separate estate, which produces a rent of 2400*l.* per annum. The income accruing by the class-fees of pupils amounts to about 30,000*l.* per annum, and a large sum is annually drawn in rents of chambers, and fees for commons, &c.

The Royal Dublin Society, incorporated by George II., 1749, occupies the late residence of the Duke of Leinster in Kildare-street. The income of the society arises from subscriptions of members, and an annual parliamentary grant of 5300*l.* Their museum is open to the public twice a week; and their professors deliver public and *gratis* courses of lectures in their several sciences. A considerable number of youths are also instructed gratis in the fine arts in the schools of the society.

The Royal Irish Academy, for promoting the study of science, polite literature, and antiquities, was incorporated in 1786. The funds of the academy are assisted by a parliamentary grant of 300*l.* per annum. The academy house is in Grafton-street, where there is a good library peculiarly rich in antient Irish MSS.

The Royal Hibernian Academy of painting, sculpture, and architecture, incorporated in 1803, also receives a parliamentary grant of 300*l.* per annum. The academy house in Abbey-street was bestowed on the body by Mr. Johnstone, the distinguished architect; and here there is an annual exhibition of painting and sculpture.

The other chief societies for the promotion of science and general knowledge, which are not incorporated, in Dublin, are the zoological, phrenological, geological, agricultural, horticultural, and Dublin-library societies.

A considerable stimulus has been given to the literary pursuits in Dublin by the establishment from time to time of various periodical works. The newspaper press of Dublin consists of eighteen different papers.

(Harris's *History of the City of Dublin*, Dublin, 1766; Whitelaw and Walsh's *History of the City of Dublin*, London, 1818; Mason's *History of the Cathedral of St. Patrick*: Brewer's *Beauties of Ireland*; *Picture of Dublin*, Curry, Dublin, 1835; *Reports of Commissioners and Parliamentary Papers*.)

DUBNO, the capital of a circle of the same name, the richest and most productive of the subdivisions of the Russian government of Volhynia. It is situated on the Irva, in 50° 25′ N. lat., and 25° 40′ E. long., and belongs to the prince of Lubomirsky, who takes from it a ducal title as its owner. The Polish nobility of these parts held their 'contracte,' or annual sessions, at Dubno from 1774 till Western Poland was usurped by Russia. Dubno is an extremely irregular town in construction; the streets are narrow, crooked, and unpaved: it contains about 1190 houses, almost wholly of wood, and 5700 inhabitants, among whom are a great many Jews; and has a ducal residence, a Greek abbey of the order of St. Basil, several Greek and Roman Catholic churches, and a grammar-school. The people carry on much traffic in corn, flax, tobacco, fish, and cattle, the produce of the adjacent country, and hold a large fair at Whitsuntide.

DUBOS, JEAN BAPTISTE, was born at Beauvais in the year 1670. He began to study theology, but soon abandoned it for politics. He was employed by M. De Torcy, minister of foreign affairs, on several secret negotiations, and on account of his talents was rewarded by a pension. Having retired from his political avocations, he devoted himself entirely to literature, and the merit of his works was sufficient to procure his admission into the Académie. He died at Paris in 1742, after a long illness.

The work by which he is chiefly known, 'Réflexions Critiques sur la Poésie et sur la Peinture,' is excellent. He first inquires into the cause of the fine arts, and discovers it in the love of excitement which is naturally implanted in the human breast: man, he thinks, would rather be unpleasantly excited than not excited at all. He then proceeds to the cause of the pleasure felt in witnessing tragical representations. He observes that, from the before-named love of excitement, people are fond of looking at executions, &c., and then remarks that, when the excitement caused by the contemplation of a real scene of misery has subsided, it is followed by the unpleasant reflection that one of our fellow-creatures has been suffering intensely. Hence a method should be devised by which we may have the excitement without the painful reflection. This end is accomplished by tragedy or a tragical picture, where the suffering, being feigned, leaves behind no feeling of regret. Keeping this principle in view, he goes on to inquire what are the proper subjects for poetry and painting, using as the standard of his judgment the greater or less degree of excitement occasioned by such and such subjects. His discussions whether the hero of a tragedy should be a person of ancient or modern history, on the appropriate use of allegories, and similar topics, are managed in the pleasantest style possible, and are besides, if we make due allowance for the French dramatic prejudices, very instructive, as well for the critical views which they contain as for the historical anecdotes with which they are illustrated. Dubos is also known as an historian by his 'Histoire de la Ligue de Cambrai,' and 'De l'Etablissement de la Monarchie Française dans les Gaules,' works which were admired by some of his contemporaries, and slighted by others.

DUCAREL, ANDREW COLTEE, an eminent English antiquary, was born in 1713, in Normandy, whence his father, who was descended from an antient family at C in that province, came to England soon after the birth of his second son James, and resided at Greenwich. In 17 whilst a scholar at Eton, he was for three months under the care of Sir Hans Sloane, on account of an accident which deprived him of the sight of one eye. In 17 he was admitted a gentleman-commoner of St. John's College, Oxford; B.C.L. 1738; LL.D. 1742; and became a member of Doctors' Commons in 1743. He was elected commissary of the exempt jurisdiction of the collegiate church of St. Katharine, near the Tower of London, in 1755, and was appointed commissary and official of the city and diocese of Canterbury by Archbishop Herring in 1758. Upon the incorporation of the Society of Antiquaries, in 1755, he was appointed one of its first fellows.

His earliest publication (without his name) was 'A Tour through Normandy, described in a Letter to a Friend,' published in 1754, in 4to., enlarged and republished in folio in 1767, under the title of 'Anglo-Norman Antiquities, considered in a Tour through part of Normandy, by Dr. Ducarel, illustrated with twenty-seven plates.' His second publication was 'A Series of above two hundred Anglo-Gallic, or Norman and Aquitain Coins of the antient Kings of England, exhibited in sixteen copper-plates, and illustrated in twelve Letters, addressed to the Society of Antiquaries of London and several of its Members,' 4to., London, 1757. His portrait, engraved by Perry from a painting by A. Soldi, 1746, was first prefixed to this work, which was the result of his acquaintance with M. de Boze, keeper of the French king's medals. In 1760 he printed for private distribution, in 4to., an account of his friend Browne Willis, read at the Society of Antiquaries that year. In 1763 he published 'A Repertory of the Endowments of Vicarages in the diocese of Canterbury,' in 4to., which was reprinted with large additions, in 8vo., in 1782, with the further addition of a repertory of endowments of vicarages in the diocese of Rochester. Dr. Ducarel gave a manuscript abstract of the large history of the Benedictine Abbey of Bec, in Normandy, drawn up by Dom John Bourget, a monk of that house, to Mr. John Nichols, who printed it in 1779, in 8vo., with an appendix of original deeds; and who likewise printed in the same year, in 2 vols. 8vo., 'Some Account of the Alien Priories, and of such lands as they are known to have possessed in England and Wales,' the chief materials of which were also collected by Dr. Ducarel. The greater part of the materials of the 'Collection of Royal and Noble Wills,' from the Conqueror to Henry VII., printed by Mr. Nichols in 1780, were likewise furnished by Dr. Ducarel.

In 1782 he published 'The History of the Collegiate Church of St. Katharine, near the Tower of London, from its Foundation in 1273.' This work had been compiled by the doctor for the use of Queen Charlotte, this church being the only ecclesiastical preferment in the gift of the queen consort of England. An appendix to this work was published in 1790, in No. LII. of Mr. Nichols's 'Bibliotheca Topographica Britannica.'

In 1783 he published, as No. XII. of the 'Bibliotheca Topographica Britannica,' 'Some Account of the Town, Church, and Archiepiscopal Palace of Croydon, in the County of Surrey, from its Foundation to 1783,' 4to., originally drawn up by him in 1754 at the request of Archbishop Herring. He also drew up in the 'Bibliotheca Topographica Britannica,' No. XXVII., 'The History and Antiquities of the Archiepiscopal Palace of Lambeth, from its Foundation to the Present Time,' 1785, 4to. dedicated to Archbishop Moore.

Dr. Ducarel's life was one of indefatigable industry. Exclusive of the works already mentioned, the publication of Snelling's plates of English medals originated with him. He wrote in the 'Philosophical Transactions' upon the subject of trees indigenous to Great Britain, followed by an account of the early cultivation of botany in England. His letter to Gerard Meerman, grand pensionary at the Hague, on the dispute concerning Corsellis as the first printer in England, translated into Latin by Dr. Musgrave, with Meerman's answer, was published in the second volume of Meerman's 'Origines Typographicæ' in 1765. He entered deeply into the Rowleian controversy, of which he entertained what is now the general opinion. He completed a list of various editions of the Bible and parts thereof, in English, from 1526 to 1776, an improved edition of which was published in 1778 at the expense of Archbishop Cornwallis. His memoirs of Archbishop Hutton and his family, fairly written, were purchased, at the sale of his library, by Dr. Lort for the Hutton family. He perfected the catalogues of the different portions of the Lambeth library, and made a general index to all the archiepiscopal registers at Lambeth, from Pecham to Herring, in forty-eight volumes in folio, his own duplicate of which was bought at the sale of the late Mr. Gough's library, for the MS. department of the British Museum. In addition to all these literary labours, his official attendance to the duties of Doctors' Commons was unremitting.

Dr. Ducarel died at his house at South Lambeth, May 29th, 1785. The immediate cause of the disorder which carried him off was a sudden surprise, on receiving, whilst at Canterbury, a letter informing him that Mrs. Ducarel was at the point of death. He was buried in his favourite church of St. Katharine, near the altar, in a vault which he had long before selected for that purpose. (Nichols's *Literary Anecdotes*, vol. vi. p. 380—404; Chalmers's *Biogr. Dict.* vol. xii. p. 375—385.)

DUCAT, DUCATOON. [MONEY.]

DUCIS, JEAN FRANÇOIS, was born at Versailles in 1732, and became a dramatic writer somewhat late in life. His first pieces made but little impression, and it was not until he had produced a version of Shakspeare's 'Hamlet' that his name began to acquire some celebrity. 'Romeo and Juliet,' the second tragedy from Shakspeare, had great success. But Ducis has so altered the works of our great author, that were it not for the name we should with difficulty discover any connexion between the original and the version. He subsequently tried to imitate the Greek drama in a tragedy called 'Œdipus with Admetus;' but he soon returned to Shakspeare, and wrote, among other pieces, 'Macbeth,' 'Othello,' and 'Lear.' In 1778 he was called to the Académie to fill the vacancy left by Voltaire. He afterwards became secretary to Louis XVIII., and was ever most devotedly attached to him. Even when almost starving, he refused a pension of 40,000 francs and the cross of the legion of honour, which were offered him by Napoleon. The restoration of his beloved king rendered his old age happy. At his first audience the king recited to him some of his own verses: 'I am more fortunate,' cried the old poet in ecstacy, than Boileau or Racine; they recited their verses to Louis XIV., but my king recites my verses to me.' He died in 1816.

DUCKBILL. [ORNITHORHYNCHUS.]

DUCKS, ANATI'NÆ, a subfamily of the *Anatidæ*, including the *true ducks* of Swainson only.

The third book of Belon is entitled 'De la Nature des Oyseaux vivants le long des rivières, ayants le pied plat, nommés en Latin *Palmipedes* Aves,' and comprehends all the web-footed birds known to him.

Willughby distinguishes the 'whole-footed birds with shorter legs into such as want the back-toe and such as have it; these latter into such as have all four toes webbed together, and such as have the back-toe loose or separate from the rest; these latter again' he subdivides 'into narrow-billed and broad-billed; the narrow-billed have their bills either hooked at the end, or straighter and sharp-pointed. The hook-billed have their bills either even or toothed on the sides. Those that have straighter and sharp-pointed bills are either short-winged and divers, called *Douckers* and *Loons*, or long-winged and much upon the wing, called *Gulls*. The broad-billed are divided into the *Goose* kind and the *Duck* kind. The *Duck* kind are either *Sea-ducks* or *Pond-ducks*.' He afterwards, in his section on the *Broad-billed Birds of the Duck kind*, thus treats (chap. i.):—*Of the Duck in general.* 'The *Duck kind* have shorter necks and larger feet in proportion to their bodies than *Geese*: lesser bodies. Howbeit, the biggest in this kind do equal if not exceed the least in that. They have shorter legs than *Geese*, and situate more backward, so that they go waddling; a broader and flatter back, and so a more compressed body; and lastly, a broader and flatter bill. Their tongue is pectinated or toothed on each side, which is common to them with *Geese*.'

'These are of two sorts, either wild or tame. The wild again are of two sorts—1. *Sea-ducks*, which feed mostwhat in salt water, dive much in feeding, have a broader bill (especially the upper part) and bending upwards (to work in the slem), a large hind-toe, and thin (likely for a rudder), a long train, not sharp-pointed. 2. *Pond-ducks*, which haunt plashes, have a streight and narrower bill, a very little hind-toe, a sharp-pointed train, white belly, speckled feathers, black with glittering green in the middle wing, with a white transverse line on either side. For this distinction of *Sea-ducks* and *Pond-ducks* we are beholden to Mr. *Johnson*.'

Ray divides his 'Palmipedes latirostræ minores, seu Anatinum genus' into *Anates Marinæ* and *Anates fluviatiles, aquas dulces præcipuè frequentantes, Anates exoticæ Brasilienses*, and *Anates Domesticæ*. Brisson's twenty-fourth order, consisting of birds with four toes, the three anterior being joined together by membranes, the posterior separated, and with a dentilated bill, includes the genera *Harle*, *Oie*, and *Canard (Goosanders, Geese*, and *Ducks)*. This order is placed between that order of birds the arrangement and connexion of whose toes is similar to the modifications of those parts in the twenty-fourth order, but which have a bill without dentilations (Puffins, Petrels, Gulls, Terns, &c.), and the twenty-fifth order, which is distinguished by the birds arranged under it having all the toes joined by membranes (the Darters, Boobies, Pelicans, &c.)

Linnæus, under his third class of birds, *Anseres*, included the genera *Anas*, *Mergus*, *Alca*, *Procellaria*, *Diomedea*, *Pelecanus*, *Plotus*, *Phäeton*, *Colymbus*, *Larus*, *Sterna*, and *Rynchops*; in short, all those birds which possess a rather blunt bill, covered with an epidermis, gibbous at the base, dilated at the apex, and with denticulated fauces, a fleshy tongue, and palmated natatorial feet. The class stands between the *Picæ* and the *Grallæ*. The genus *Anas* comprehends the swans, the geese, and all the ducks, in the general acceptation of the term.

Pennant's twenty-fourth genus, *Duck*, is placed between the genus *Merganser* (Goosander) and the genus *Corvorant*; and it comprehends the swans, the geese, and all the ducks, like the Linnean genus *Anas*.

Latham, who divides the birds into *terrestrial* and aquatic, makes his ninth order, *Palmipedes*, consist of two great sections: the first consisting of those with long feet —Avoset and Flamingo for example,—and the second of those with short feet, comprehending all the short-limbed aquatic birds with webbed feet.

Lacépède's second subclass of birds consists of those the lower part of whose legs is denuded of feathers, or have many toes united by a membrane. The first division of this subclass consists of those which have three anterior toes and one posterior toe, or none. The first subdivision consists of the *Water Birds*, *Oiseaux d'Eau*; and the twenty-third order of Lacépède comprehends those genera which have a dentilated bill, viz., *Canard*, *Anas*; *Harle*, *Mergus*; *Prion*, *Prion*. The genus *Anas* consists of all the birds which combine with the characters above stated a wide bill, rounded at its extremity, and furnished around the mandibles with small vertical laminæ.

Duméril (*Zoologie Analytique*, 1806) divided the birds into six orders. The last of these is formed by the Palmipèdes; and the first family of that order, the *Serrirostres* or *Prionoramphes*, contains the genera *Canard*, *Harle*, and *Flammant* (Flamingo).

Meyer's ninth and last order, *Natatores*, contains three sub-orders; the second of these, *Lamelloso-dentati*, includes *Cygnus*, *Anas*, *Anser*, and *Mergus* (1810).

Illiger (1811) made the *Natatores* his seventh and last order, and the *Lamelloso-dentati*, the third section, comprehends the genera *Anas*, *Anser* (Brisson), and *Mergus*.

Cuvier's sixth and last order is the *Palmipèdes*; and the last family of that order, *Lamellirostres*, contains the great genus *Des Canards* (*Anas*, Linn.). Cuvier remarks that they are commonly divided into three subgenera, the limits of each of which are not very precise, viz., the swans (*Cygnus*, Meyer), the geese (*Anser*, Brisson), and the ducks, in the general acceptation of the term (*Anas*, Meyer). The other great genus of Cuvier's *Lamellirostres* is *Mergus*, Linn.

Cuvier separates the genus *Anas* into two divisions. The first consists of those whose hind toe is bordered by a membrane, whose head is larger and neck shorter in comparison, and which have also the feet placed more backwards, the wings smaller, the tail stiffer, the tarsi more compressed, the toes longer, and the webs more entire. They walk badly, live more exclusively upon fishes and insects, and dive more frequently. (*Platypus*, Brehm; *Hydrobates*, Temminck; *Fuligula*, Charles Bonaparte.) This first division contains the following subdivisions: *Les Macreuses* (*Oidemia* Fleming, *Anas nigra*, *A. fusca*, Linn., &c.); *Les Garrots* (*Clangula*, Leach; *Anas glacialis*, *A. histrionica*, Linn., &c.); *Les Eiders*, Eider ducks, *Somateria*, Leach, *Anas mollissima*, Linn.: *Les Millouins*, *Fuligula*, Leach.

The second division is formed by those ducks which are without the membranous border on the hind toe, and have the head smaller, the feet less, the neck longer, the bill more equal, and the body less clumsy (épais). These walk better, and seek aquatic plants and their seeds as much as [illegible] and other animals. It would seem, adds Cuvier, that the [illegible] of their tracheæ are of a homogeneous bony [illegible] cartilaginous substance. It is to this division that [illegible] Lucian Bonaparte, prince of Musignano, confines [illegible] *Anas*. The following are the subdivisions: [illegible] *Rhynchaspis*, Leach; *Les Tadornes*, *Anas* [illegible] Linn., &c.; those which have naked parts about [illegible], and often a boss or convexity on the base of the bill, as the Muscovy duck; those with a pointed tail, *Anas acuta*, Linn., for instance; those whose male has curled feathers in the tail, as the wild duck, *Boschas*, *A[illegible] Boschas*, Linn.; those which have a tuft on the head [illegible] the bill rather narrower anteriorly, as the Summer duck, *Anas sponsa*, Linn., and the Mandarin duck, *Anas galericulata*, Linn., *Dendronessa*, Swainson; those which have the bills of ducks, but legs even longer than those of the geese, and which perch and nestle in trees, *Anas arborea*, Linn., &c. One of these Cuvier observes has the feet only semipalmated, *Anas semipalmata*, Latham. Finally, Cuvier goes on to state that we possess, especially in winter, among those which have nothing remarkable about them, *Anas strepera*, Linn., *A. Penelope*, Linn.; and many small species which are distinguished by the name of *Surcelles*, Teals, *Anas querquedula*, Linn., the common Teal, for example.

Vieillot's fifth and last order is again denominated *Natatores*: it consists of three tribes, viz., the *Téléopodes*, the *Atéléopodes*, and the *Ptiloptères* (*Ptilopteri*). The third family of the *Téléopodes*, the *Dermorhynques*, contains the genera *Harle*, *Oie*, *Cygne*, and *Canard*; and this family is placed between the Divers (Plongeurs) and the *Pélagiens*, consisting of the gulls, terns, &c.

The *Palmipèdes* form M. Temminck's fifteenth order, which contains the whole of the true web-footed birds. The genera are numerous, and, among them, the duck (*Canard*) and the goosander (*Mergus*) are placed between the albatros and the pelican (1815 and 1820).

M. de Blainville (1815, 1821, 1822) divides *Natatores* or Swimmers into the *Macroptères* (Mouettes), *Syphorhiniens* (Petrels), *Cryptorhyniens* (Pelicans), and *Colymbiens*. The latter he subdivides into the *Ailés* (*Canards*), *Sub-Ailés* (*Plongeons*); and *In-Ailés* (*Manchots*, Penguins).

Mr. Vigors, in his paper 'On the natural Affinities that connect the Orders and Families of Birds,' read before the Linnean Society, December 3, 1823 (*Trans. Linn. Soc.*, vol. xiv., p. 395), makes his fifth order *Natatores* consist of the families stated in the article DIVERS (vol. ix., p. [illegible]). The family of *Anatidæ* (Leach), to which he leads his readers from the preceding order (*Grallatores*) by means of the connexion between the *Rallidæ* and *Cereopsis*, consists, he observes, of the groups which compose the Linnean genera *Anas* and *Mergus*, and, with respect to the affinities that prevail throughout the families of the order, he remarks that the more extensive subdivisions of the Linnean *Anas* which have been acknowledged by all systematic writers, either under the name of sections or genera, display in conjunction with *Mergus* a regular series of affinities conformable to the principles advanced by him as regulating the order. The first group, he observes, upon which we enter in this first aberrant family of the order, has been formed into a sectional subdivision by M. Temminck, under the denomination of '*Les Oies*;' and with equal signification and more effect has been made into a genus, under the title of *Anser*, by M. Illiger, who therein followed the old naturalists that preceded Linnæus. These birds retain much of the manners of the *Waders*. They are endowed with considerable facility in walking, are found to swim but seldom, and do not dive at all. In these characters, as well as in other particulars, they correspond with the family of *Laridæ*, which meets them at the other extremity of the circle of *Natatores*.

To this division succeeds *Cereopsis*, Lath., strongly allied to the preceding *Anseres* by its general structure, but [illegible] more typical in the family in consequence of the length and nakedness of the *tarsi* above the knee: characters which indicate a greater power of walking, and a greater deficiency in swimming. It joins the third division, or the genus *Anates*, by means of a group of which *Anas arborea*, Linn., is the representative. This third and most typical group of the family, which accords with M. Temminck's first section of '*Canards proprement dits*,' still approaches more closely to the land birds than the birds which follow: the species swim with ease, and even dive, but the latter faculty they seldom exercise unless when pursued. Their food is also less exclusively marine than that of the succeeding group, being composed of vegetables, grains, and insects, in addition to fish. This division, consisting of many prominent forms, of which *Anas arborea* before mentioned, *A.* [illegible] *boschus*, *clypeata*, *penelope*, and *querquedula*, may be considered types, is distinguished from the remainder of the 'Canards proprements dits' of M. Temminck by the hind toe being entire, or free from the lobated membrane which is attached to the hind toe of these last. Mr. Vigors proceeds to state that this character of the lobated membrane, which is of considerable importance as pointing out the approach of the birds in which it is found to the more typical oceanic families, prevails in all the remaining groups of the present family. It is strongly conspicuous in *Mergus*, Linn., the next division that appears to follow: and we consequently find that the species of that genus carry the powers of swimming and diving to the greatest extent, making use of their wings also in their progress through the water; and at the same time exhibiting a constrained and embarassed mode of walking, in consequence of the backward position of the legs. It thus forms the passage to the succeeding family of *Colymbidæ*. In the shape of its bill, which is slender and partially compressed, it exhibits a distinct form in its own family: but still, by means of the bill of an intervening species, *M. albellus*, Linn., which is intermediate in its breadth and depression, it preserves its connexion with the *Anates*. 'We hence,' continues Mr. Vigors, 'pass to the fifth and last group of the family which, with the bill of the *Anates*, retains most of the characters conspicuous in *Mergus*. The forms most prominent in it, represented by the different Linnæan species *A. ferina*, *clangula*, *histrionica*, and *mollissima*, possess a strongly lobated hind toe; they frequent the ocean for the most part, where they dive with the greatest facility and for a length of time; and they live chiefly on marine animals. Their legs are also thrown behind the equilibrium of their body; and thus also they evince their contiguity to the typical *Natatores*. By means of the group which contains *A. mollissima*, our well known *Eider Duck* and its congeners, where the bill, with an elevated protuberance at the base, approaches that of the *Anas olor*, Linn., we find ourselves brought round to the *Cygnus* of the present day, which forms part of the first division. That genus in like manner deviates partially from the conterminous genus *Anser*, in its legs being thrown more backward, and its consequently greater awkwardness in walking. Here then the affinities are evident which thus establish the perfect return of the series of the *Anatidæ* into itself. Before we leave the family, I must indulge myself in observing a most conspicuous peculiarity which marks the series of affinities among these groups. The long and slender neck observable in the *Grallatores* is preserved in such groups of the *Anatidæ* as are most conterminous to that order, such as *Cygnus*, *Anser*, *Bernicla* and *Cereopsis*, until it is superseded by the short necks of the more oceanic *Anatidæ*, which exhibit all the expansion and capaciousness of throat observable in the typical *Natatores*.'

M. Latreille, in his Method (1825), makes the *Palmipèdes* his seventh and last order; and the *Lamellirostres*, the first of its four families, consist of the genera *Cygne*, *Oie*, *Anatique*, *Canard*, *Harle*.

The method proposed by M. de Blainville in 1815 and 1821, and developed by M. Lherminier in 1827, places the ducks (*Canards*, *Anas*) between *Pelecanus* and *Podiceps*, in the first sub-class, or that of the *Normal Birds*.

In the Zoological Journal (vol. ii., p. 404, 1825-6), Mr. Vigors gives a disposition of the Anatidæ which, as he says, exhibits a slight deviation from that drawn out in his paper on 'the Affinities of Birds,' and adopted by Mr. Stephens in the 'General Zoology.' Mr. Vigors states, in making this second disposition, that he does not think, upon consideration, that the two sub-families of the '*Canards proprement dits*' of M. Temminck can be said to be so far separated from each other as by the intervention of another sub-family: while *Cygnus* appears to hold a separate station of equal rank with the other sub-families. The series of affinity, however, according to Mr. Vigors, remains unaltered: a partial change only taking place in the mode of selecting the types of each sub-family. *Mergus* seems to belong to the fourth sub-family, in his opinion, but to be at the extremity of it; in fact to be osculant between the families of *Anatidæ* and *Colymbidæ*. The following is the arrangement proposed by Mr. Vigors in the Zoological Journal.

ORDO V. NATATORES, Ill. (Anseres, Linn.)

1. FAM. ANATIDÆ, Leach. (Gen. *Anas Mergus*, Linn.)

*

Sub-fam. Anserina.

Anser. Briss.; *Bernicla*, Steph.; *Cheniscus*, Brookes's M.M.S.; *Chenoplex*, Steph.; *Plectropterus*, Leach.

* *

Sub-fam. Cereopsina.

Cereopsis, Lath.

* * *

Sub-fam. Anatina.

Tadorna, Leach; *Cairina*, Flem.; *Anas*, Auct.; *Dafila*, Leach; *Mareca*, Steph.; *Querquedula*, Ray; *Rhynchaspis*, Leach.

* * * *

Sub-fam. ?

Clangula, Flem.; *Harelda*, Ray; *Mergus*, Linn. (*Merganser*, Briss.); *Somateria*, Leach; *Oidemia*, Flem.; *Biziura*, Leach.

* * * * *

Sub-fam. Cygnina.

Cygnus, Meyer.

The other four families are—2. Colymbidæ, *Leach*; 3. Alcadæ; 4. Pelecanidæ, *Leach*; 5. Laridæ, *Leach*.

Mr. Yarrell in his 'Observations on the Tracheæ of Birds,' read before the Linnean Society, February 6, 1827 (*Linn. Trans.*, vol. xv., p. 378), after speaking of the form of the windpipe, among others of the black swan of New Holland, *Anas atrata*, Linn., and of that of the semipalmated goose, *Anas semipalmata* of Dr. Latham, goes on to remark that the different species of geese considered British present nothing remarkable in their tracheæ, the Egyptian goose alone excepted, the male of which species possesses a bony enlargement at the bottom of its windpipe; and he notices the circumstance that systematic authors seem to agree in placing this bird at the bottom of the list of the geese, where it appears to occupy its proper situation; and observes that, combining as it does some of the characters common to those birds and the true ducks, it becomes a very natural link between them, and he closes his interesting paper with an arrangement of the British species of the latter portion of this family *founded upon internal as well as external conformation*.

'The first division of true ducks,' says Mr. Yarrell, 'will contain the Shieldduck, Muscovy, Wild Duck, Gadwall, Shoveler, Pintail, Wigeon, Bimaculated Duck, Garganey, and Teal, all of which will be found to have the following characters in common. Externally they exhibit considerable length of neck: the wings are also long, reaching to the end of the tail; the tarsi somewhat round; the hind toe free or having no pendent lobe. In habits they may be stated generally as frequenting fresh water, but passing much of their time on land, feeding in ditches and about the shallow edges of pools on aquatic plants, insects, worms, and occasionally fish, taking their food at or near the surface; possessing great powers of flight, but seldom diving unless pursued. Of their internal soft parts, the stomach is in the greatest degree muscular, forming a true gizzard; the intestines long, the cæcal appendages from six to nine inches in length in the larger birds, and decreasing only in proportion to the size of the species. Of the bones it may be observed that the ribs are short, extending but little beyond the line of the posterior edge of the sternum; the keel of the breast-bone deep, affording great extent of surface for the insertion of large and powerful pectoral muscles; the enlargement at the bottom of the trachea in all of them is of bone only. The wild duck may be considered the type of this division.'

Mr. Yarrell then proceeds to state that the Eider Duck, King Duck, Velvet Duck, and Scoter, possessing some characters common to the preceding class, and others belonging to that next in succession, appear to supply the link between these two divisions; and he regrets that the extreme rarity of the last-named species had prevented him from making any examination beyond that afforded by the external parts of preserved specimens in collections.

The next division of true ducks, according to Mr. Yarrell, includes in the following order the Red-crested, the Pochard, Ferruginous, Scaup, Tufted, Harlequin, Long-tailed, and Golden-eye; and their general distinctions, he remarks, internal as well as external, compared with those of the birds of the first division, will be found of an opposite character. Externally, they exhibit the neck and wings short, the latter only reaching to the origin of the tail-feathers; the tarsi short and compressed; the hind toe lobated, and an extended web to the inner toe. They frequent the sea, or the deep parts of the fresh-water lakes, and have been called oceanic ducks; they are seldom seen on land, their walk is embarrassed from the backward position of their legs, but they dive constantly and with great facility, taking their prey at various depths below the surface; their food consists of finned and shell-fish, and marine insects, but of little or no vegetable production; and their powers of flight are moderate. With regard to their soft parts, Mr. Yarrell states that the œsophagus is capable of great dilatation, that the stomach is a muscular gizzard, but that the internal cavity increases in size, the stomachs of the long-tailed duck and golden-eye most resembling the stomach of the mergansers, whilst the intestines and cæcal appendages are shorter, the latter diminishing from six inches in the first to four and a half in the tufted duck, three inches in the long-tailed, and but two in the golden-eye. The ribs of the birds of this division, according to the same author, are elongated; the keel of the breast-bone gradually decreases in depth; the position of the wings is more forward, and the legs are placed further back. The tracheæ of these ducks, moreover, are particularly distinguished from those of the others by the enlargement at the bottom of the tube being covered with a delicate membrane, supported by slender portions of bone; the trachea of the red-crested duck is an example of this form, and Mr. Yarrell is of opinion that it may be considered the type of this division.

As the Egyptian goose, continues Mr. Yarrell, has in this arrangement been considered the link between the geese and the first division of the true ducks, from its possessing, with the characters of the former, the bony enlargement of the trachea common to the latter; and the velvet duck, for similar reasons, supplying the link between the two divisions of true ducks, possessing, among other characters, an altered form of the bony enlargement of the trachea of the one, with the lobated toe of the other; so the golden-eye, the last of the series, appears to complete the arrangement by exhibiting some of the characters found in the Mergansers, which are next in succession. The first point of similarity is found by Mr. Yarrell in the elongated feathers of the top of the head, forming a crest; they agree also, he adds, in the shape of the sternum, and a particular extension of its posterior edge, becoming an ensiform process; and this extension of the edge of the breast-bone prevails in the genera colymbus, alca, and uria; and, with the elongation of the ribs observable in all good salt-water divers, seems intended as a protection to the important viscera of the abdomen, and enables them to resist pressure when below the surface. The golden-eye, in the opinion of the same author, is also intermediate in its stomach, intestines, and cæcal appendages, the latter being only two inches in length. In the goosander indeed Mr. Yarrell found that these appendages reached three inches; but, as he well observes, the size of the bird being considered, they are reduced on a comparative estimate to less than two; in the red-breasted merganser he found them to measure but one inch, and the swan he states is without any. In the form of its trachea, the golden-eye, it seems, more closely resembles the mergansers than that of any other duck, by the enlargement in the tube, and in the shape of the labyrinth. 'Thus the whole of the numerous species of the *Anatidæ* appear to descend to the more perfect water birds by gradations, but with well-marked divisions throughout.'

C. L. Bonaparte, in his 'Tabella Analitica dei Generi,' (Specchio Comparativo, 1827) makes his 'Ordine' *Anseres* consist of five families: the *Longipennes*; the *Lamellosodentati*; the *Steganopodes*; the *Lobipedes*; and the *Pygopodes*. His 'Famiglia' *Lamelloso-dentati* comprises the two genera *Anas* and *Mergus*, the first of which he characterizes thus—'Becco depresso, ottuso, con denti lamelliformi;' and it comprehends the swans, geese, and ducks in the large meaning of the term.

M. Lesson, in his 'Manual' (1828), makes the *Anatidæ* (*Lamellirostres* of Cuvier) the fifth and last family of the sixth order, *Les Palmipèdes*, *Natatores* of Illiger and Vieillot. Under the *Anatidæ* he arranges the genera *Cygnus*, Meyer; *Anser*, Brisson, with its subgenera; *Cereopsis*, Latham; *Anas*, Linnæus; and *Mergus*, Linnæus. The genus *Anas* he divides into two sections.

The *first section* embraces those ducks which have the hind toe (pouce) bordered with a membrane (*Hydrobates* of Temminck), and contains the following subgenera:—1st. *Macreuse*, Cuv., *Maceranas* (*Anas fusca*, Linn., *A. nigra*, Linn.) 2nd. *Macroramphe*, *Macroramphus* (*Anas perspicillata*, Linn.) 3rd. *Hydrobate*, *Hydrobates*, Temm. (*Anas lobata*, Shaw.) 4th. *Garrot*, Cuv., *Histrionicus* (*Anas histrionica*, Linn.) 5th. *Eider*, Cuv., *Platypus*, Brehm, *us mollissima*, Linn.) 6th. *Millouin*, Cuv., *Fuligula*, (*Anas fuligula*, Linn.) 7th. *Microptère*, *Micropterus* *s brachyptera*, Latham.)

The *second section* includes those ducks whose hind toe is not bordered by a membrane, and the following subgenera are arranged under it:—8th. *Souchet*, Cuv. *Clypeata* (*Anas clypeata*, Linn.) 9th. *Tadorne*, Cuv., *Tadorna*, Leach, (*Anas tadorna*, Linn.) 10th. *Musqué*, *Moschata* (*Anas moschata*, Linn.)

The 11th subgenus is formed of the *Canard proprement dit*, *Anas*, and is separated into two subdivisions. 1st. *Les Pilets*, which have the tail pointed or surpassed by the two largest quills; Type: *Le Pilet* (*Anas acuta*, Linn.) and The *true ducks*, distinguished by the curled feathers on the upper tail-coverts; Type: (*Anas boschas*.)

The 12th subgenus is the *Canaroie*, *Anseranas* (*A. melanoleuca*, Latham, Cuv.); and the 13th the *Sarcelles*, *Teals*, *Querquedula*, Brisson (*Anas querquedula*, Linn., *Anas crecca*, Linn., &c.)

Mr. Swainson, in his paper 'On those Birds which exhibit the Typical Perfection of the Family of Anatidæ' (*Journal of the Royal Institution of Great Britain*, August, 1831), remarks, that the most superficial observer, on looking to the family of the *Anatidæ*, or ducks, under which he will include the geese and swans, must be struck by the remarkable shape and structure of the bill, totally different from that of all other birds. This, in fact, he adds, is the only group in the aquatic order wherein the bill is very considerably dilated in its breadth, and of a texture unusually soft. In addition to these, a third and a very important character is discerned; the cutting margins of the bill are provided with numerous transverse lamellar plaits, so much developed in some species as to project beyond the bill, thus assuming an analogy to the teeth of quadrupeds. This analogy, however, is more imaginary than real, since these appendages are destined for a very different purpose. The feet, although in general short, are adapted to more than one purpose, since they are not only used for swimming and diving, but for walking.

Mr. Swainson proceeds to state that 'the gulls feed indiscriminately upon marine animals, whether living or dead; they are the purifiers of the waters as the vultures are of the land. The pelicans and the penguins derive their support from those large fish which the more feeble gulls can neither capture nor swallow, while the terns skim the ocean in search of small fish which rise to the surface. But the inconceivable multitudes of minute animals which swarm, as voyagers assert, in the northern seas, and the equally numerous profusion inhabiting the sides of rivers and fresh waters, would be without any effectual check upon their increase, but for a family of birds destined more particularly for that purpose. In the structure, accordingly, of the ducks, we see all these qualifications in the utmost perfection. By means of their broad bill, as they feed upon very small and soft substances, they capture at one effort considerable numbers. Strength of substance in this member is unnecessary: the bill is therefore comparatively weak, but great breadth is obviously essential to the nature of their food. As these small insects also which constitute the chief food of the *anatidæ* live principally beneath the surface of mud, it is clear that the bill should be so formed that the bird should have the power of separating its nourishment from that which would be detrimental to the stomach. The use of the laminæ thus becomes apparent: the offensive matter is ejected between their interstices, which, however, are not sufficiently wide to admit the passage of the insect food at the same time. The mouthful of stuff brought from the bottom is, as it were, sifted most effectually by this curiously-shaped bill; the refuse is expelled, but the food is retained. It is probable also that the tongue is materially employed on this process; for unlike that of all other birds, it is remarkably large, thick, and fleshy. From being so highly developed, it must be endowed with an unusual degree of sensation; and indeed, a very exquisite sense of taste must belong to any animal which has to separate its food from extraneous substances, without deriving any assistance in the process from its powers of sight: against this deficiency nature has wisely provided, by heightening and increasing the senses of taste and touch.'

In the physiological series of the Museum of the Royal College of Surgeons in London—Gallery (317)—is the head of a Muscovy duck, *Anas Moschata*, Lynn., showing the serrated character of the margins of the mandibles, and the peculiar tuberosity at the base of the beak; and a good opportunity of studying the structure of the tongue is afforded by the preparations numbered 1468 and 1469 In the [illegible] nus are seen the bones of the tongue and upper larynx of a swan (*Cygnus Olor*, Bechst.). The glosso-hyal part is broader and longer than it is in the land birds, corresponding to the greater development of the tongue in the lamellirostral swimming birds, but is devoid of the cartilaginous processes at its posterior angles in the gallinaceous tribe. In the larynx may be distinguished the thyroid, cricoid, and arytenoid cartilages, which in most birds are more or less bony: the thyroid cartilage is the largest, and covers the whole anterior part of the larynx like a shield; the posterior broad part of the cricoid (which is not in this class developed in the form of a ring) supports as usual the arytenoid cartilages which form the *rima glottidis*: they have muscles for opening and closing that fissure, and the larynx is defended by the latter action alone from the entrance of food or fluid. No. 1363 exhibits the lower jaw, with the tongue and larynx of the same bird, and it will be seen that the tongue is so far developed as to correspond with the form of the lower jaw. It is a thick and fleshy organ, beset with four longitudinal rows of horny tooth-like processes, two at the sides, and two on the dorsum, separated by a mesial furrow: the base of the tongue is also armed with retroverted spines arranged in a chevron figure; similar spines again occur behind the larynx. The apo- and uro-hyal bones are dissected on one side, but covered by the muscles on the other.

Mr. Swainson, in the paper above quoted, divides the genus *Anas* (which he thus characterises 'Bill longer than the head, depressed nearly its whole length. The base not enlarged, the tip very obtuse; the laminæ of the upper mandible generally projecting. Hinder toe not dilated, short; claws short, thick') into the following sub-genera:

	Sub-genera.
1. *Typical Group.*	
Bill spatulate, simple; laminæ considerably projecting.	ANAS, Lin.
2. *Sub-typical Group.*	
Bill spatulate, furnished with a lobed membrane; laminæ considerably projecting.	MALACORHYNCHUS, Sw.
3. *Aberrant Group.*	
Bill of equal breadth; projecting laminæ short, slender, acute, crowded.	CHAULIODUS, Sw.
Bill more cylindrical, lengthened; tail long.	DAFILA, Leach.
Bill depressed, of equal breadth; laminæ distant, obtuse, and generally concealed; tail short.	BOSCHAS, Antiq.

The type of the genus Anas is considered by Mr. Swainson to be the shoveler duck; and he thus speaks of the arrangement above set forth: "In regard to the tabular disposition of the five sub-genera, or types of form, it will be expected that I should say a few words, since it is at variance with the mode of exhibiting circular affinities adopted by that distinguished writer who first detected this arrangement. On this point I must refer the reader to the ornithological volume of the 'Northern Zoology,' now about to appear, where he will find our peculiar views explained and illustrated. I have, indeed, chosen to enumerate, in both instances, the subordinate divisions of the aberrant group, but they are always viewed by me as forming a distinct circle of their own, *the primary divisions of every natural group being considered* as THREE and not FIVE. In the present instance, the three sub-genera of *Chauliodus, Dafila* and *Boschas*, possess one common character, in not having the bill conspicuously dilated at its extremity; while their circular succession can hardly be questioned, when we find the greatest modern reformers* leave the *Gadwall and the Mallard in the same group*; these writers having overlooked the modifications of the laminæ, and passed over the differences in the habits of these birds, as not bearing upon the question. The theory that the mallard is the typical representation of this family has now, I trust, been thoroughly investigated, and demonstrated to be erroneous;† nor can I consider the two circular arrangements‡ that have been made of the whole family, each apparently perfect, but essentially different, in any other light. They appear to me to be the result of abstract theory, and of a theory misapplied. On the other hand, I deem it but justice to the great merits of another ornithologist of our own country to acknowledge the assistance I have derived from his highly valuable paper on the tracheæ (trachea) of birds,* and, at the same time, to declare that if there is any truth in his own divisions, drawn from internal structure, or in mine, resulting from attention to external form and habits, he has himself marked out the true circle of the Anatidæ, so far as the British species are concerned, *totally unconscious of having done so*. There is, and there cannot be, but one plan of creation. In our efforts to develop this plan we must, as Mr. Yarrell justly observes, 'combine ascertained habits, external characters, and anatomical structure;' and in proportion as we can do this so may we assume that our arrangement is 'natural.'"

We entirely agree with the author above quoted in the praise awarded to Mr. Yarrell; but we hesitate to join in the conclusion that he has 'marked out the true circle of the Anatidæ, so far as the British species are concerned, *totally unconscious of having done so*,' an expression repeated also in italics in the second volume of '*Fauna Boreali-Americana*.' Mr. Yarrell proposed his method on the combined principles of 'ascertained habits, external characters, and anatomical structure;' and his paper, though it is marked with his usual modesty, shows that he well knew all those principles and their value as elements of arrangement. In addition to this, we have the best authority for stating that Mr. Yarrell had not the want of consciousness attributed to him.

Dr. Richardson ('Fauna Boreali-Americana') observes that the *Anatidæ* are 'of great importance in the fur-countries, as they furnish at certain seasons in the year, in many extensive districts, almost the only article of food that can be procured. The arrival of the water-fowl marks the commencement of spring, and diffuses as much joy among the wandering hunters of the arctic regions as the harvest or vintage excites in more genial climes. The period of their migration southwards again, in large flocks at the close of summer, is another season of plenty, bountifully granted to the natives, and fitting them for encountering the rigour and privations of a northern winter. The *Anatidæ* have therefore very naturally been observed more attentively than any other family of birds, both by the Indians and white residents of the fur-countries; and as they form the bulk of the specimens that have been transmitted to England, they are also better known to ornithologists.'

Sub-family, ANATINÆ, Swainson. (The true Ducks.)

Geographical Distribution. Dr. Richardson, in the work last quoted, states, that *Anas clypeata* and *A.* (*Dafila*) *acuta* frequent chiefly the clear lakes of the northern districts, and breed in the barren grounds, being found in numbers in the more southern woody districts in spring and autumn only. *A.* (*Boschas*) *domestica*, *A.* (*Chauliodus*) *strepera*, and *Mareca Americana*, breed in the woody districts up to their most northern limits, in latitude 68°. *A.* (*Boschas*) *crecca* is abundant to the extremity of the continent, both in the woody and barren districts. *A.* (*Boschas*) *discors*, though very plentiful on the Saskatchewan, was not observed farther north than the fifty-eighth parallel; while *Dendronessa sponsa* seldom goes to the northward of the fifty-fourth degree of latitude, and is rare even to the southward of that parallel.

It appears also from Dr. Richardson's tables that *Anas Clypeata* was observed in 70° lat. N. migratory across the continent; numerous: that it was observed on the Saskatchewan, in 53° to 54° N. lat., and from 600 to 1000 miles distant from the sea coast, very common as a bird of passage in spring and autumn; that it frequents the vicinity of Philadelphia, rather common in winter (Bonaparte), and that its winter quarters are in the United States and Mexico. *A.* (*Chauliodus*) *strepera* has been noticed in 68° N. lat. east of the Rocky Mountains, migratory; and on the Saskatchewan (same range of lat. and same distance from the sea coast) common in summer; rare in the vicinity of Philadelphia in winter (Bonaparte): its winter quarters are the Mexican lakes (Swainson):—*A.* (*Dafila*) *caudacuta* in lat. 70° east of the Rocky Mountains, migratory; very common; and on the Saskatchewan, as above, in spring and autumn, but not rare; common in the vicinity of Philadelphia in winter (Bonaparte); and having its winter quarters in the Mexican lakes (Swainson). *A.* (*Boschas*) *domestica* in lat. 68°; migratory across the continent; common on the Saskatchewan, as above, in the summer; common in the vicinity of Philadelphia in the winter (Bonaparte); and having its winter quarters in the Middle and Southern States, Columbia R. and California. *A.* (*Boschas*) *crecca*, in lat. 70°, migratory across the continent; very abundant; on the Saskatchewan, as above, abundant in summer; very common near Philadelphia in the winter (Bonaparte); and with its winter quarters in the Middle and Southern States towards the tropics. *A.* (*Boschas*) *discors*, in lat. 58°, migratory across the continent; very abundant; and on the Saskatchewan, as above, abundant in summer; very common near Philadelphia, in summer (Bonaparte); and with the Mexican States, Columbia R. and California for its winter quarters. *Mareca Americana*, in lat. 68°, migratory; rather common on the Saskatchewan, as above, in summer; common near Philadelphia in the winter (Bonaparte); wintering in the Middle and Southern States and the West Indies. *Dendronessa sponsa*, in lat. 54°, migratory; rare on the Saskatchewan, as above, in summer; common in the vicinity of Philadelphia, in summer (Bonaparte); wintering in the Southern States, Mexico? West Indies.

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* Drs. Leach, Fleming, Stephens, [illegible] Vigors.

† [illegible]

‡ [illegible]

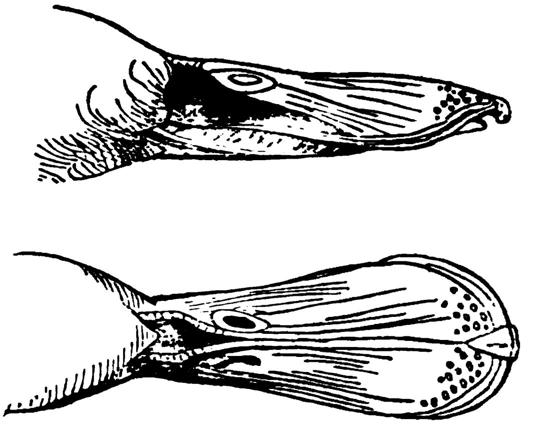
* Linn. Trans. vol. xv. p. 378.

In the same work we find in the list of species which merely winter in Pennsylvania, and migrate in summer to rear their young in the fur-countries, *Anas clypeata*, *A.* (*Chauliodus*) *strepera*, *A.* (*Dafila*) *caudacuta*, *A.* (*Boschas*) *domestica*, *A.* (*Boschas*) *crecca*, and *Mareca Americana*;—in the list of species which summer (or breed) in the fur-countries and in Pennsylvania, but winter farther to the southward, *Anas* (*Boschas*) *discors* and *Dendronessa sponsa*;—and in the list of species common to the Old World and the fur-countries, *Anas clypeata*, *A.* (*Chauliodus*) *strepera*, *A.* (*Dafila*) *acuta*, *A.* (*Boschas*) *domestica*, and *A.* (*Boschas*) *crecca*.*

Food, Habits, &c.—The *Anatinæ* feed on soft substances, such as fresh-water insects and tender aquatic plants, which they procure near the surface, or, aided by the length of their necks, at the bottom, in shallow muddy places, and worms and slugs, which they search for among the grass. By day they resort to small lakes and rivers, and in the night retire to the fields. They are strong and swift on the wing, and are watchful birds, that seldom dive to escape pursuit, unless when moulting; but when disturbed fly away, making at the outset a circle in the air to survey the cause of their alarm. ('Fauna Boreali-Americana.') Dr. Richardson gives in a note the following interesting information derived from an intelligent keeper of a decoy in the neighbourhood of the Rev. W. Booth of Friskney, in Lincolnshire, to whom Dr. Richardson expresses his obligation for the statement:—'Skelton is unacquainted with the habits of the Gadwall; but he tells me that the widgeon and pintail do not willingly dive: of course, if driven to it, they can, but they do not dive for their food; and though in play they sometimes splash under water, they never remain beneath the surface like the pochard. With respect to *food* · the mallard, pintail, and teal frequent rich flooded lands, "*swittering with their nebs in the soil, and sucking out its strength*;" but the widgeon feeds quite differently, being "*an amazing fowl to graze, a strange eater of grass.*" It is especially fond of 'flutter-grass' (*Glyceria aquatica vel fluitans?*) which it crops on the surface, but it likewise eats many other herbs. When the decoy has been so full of widgeons that they have devoured every blade on the landings, Skelton has taken advantage of their absence in the night, when they resort to the green salt marshes on the sea coast, and laid down sods pared from the fields, on which they readily graze. In common, however, with the mallard, teal, and pintail, they are fond of willow-weed, seeds (*Epilobium?*) with which he feeds all the fowl in the decoy, as they prefer it to oats and every other kind of grain.' Mr. Waterton states that 'the widgeon feeds by day, eating grass like a goose; whilst its congener the mallard invariably refuses this food and seeks for its sustenance by night.'

Sub-genera. Anas.

Example. *Anas clypeata* (Linn.) *The Shoveler.*—This is the *Souchet* of the French, *Cucchiarone* of the Italians, *die Schild-Ente*, and *Löffel-Ente* of the Dutch, *Mimenick* of the Cree Indians, *Hwyad lydanbig* of the antient British, *Rhynchaspis clypeata* of Shaw's Zoology (Leach MSS.), *Spathulea clypeata* of Fleming. The *Anas rubens* of Gmelin is said to be the young male, or a variety of the young male. It is provincially termed *Blue-winged Shoveler*, *Kertlutock*, and *Broad-bill*.



Bill of Shoveler.

Description of a male killed at Fort Franklin, M[illegible] 1826. *Colour.*—Head, adjoining half of the neck, m[illegible] stripe to the interscapulars, the whole back, interior scapulars, and primaries, umber-brown; sides of the head, [illegible] neck, and crest, glossed with duck-green; rump and [illegible] coverts above and below, with blackish green. Lower [illegible] of the neck, the breast, shoulders, shorter scapulars, end[illegible] the greater coverts, and sides of the rump, white; l[illegible] scapulars striped with berlin-blue, white and blackish brown. Lesser coverts berlin-blue. *Speculum* brilliant grass-green, broadly bordered above, and narrowly edged below with white; bounded interiorly with greenish black. Belly and flanks deep orange-brown, the latter undulated posteriorly with black. *Bill* black. *Legs* orange.

Form.—*Bill* a little higher than wide at the base, much depressed, dilated and rounded at the end. Mandibles furnished with long, slender, crowded laminæ, the upper ones acute and projecting, forming an apparatus admirably fitted for sifting small insects from the water. Surface of the upper mandible pitted near its oblong *unguis*. *Wings* scarcely an inch longer than the tail, which is graduated, moderately acute, and consists of 14 acute feathers. Tarsi scarcely compressed. Hind-toe not lobed, and the outer toe shorter than the middle one, as in the rest of the *Anatinæ*.

The female is liver-brown above, with broad borders of pale wood-brown; underneath pale wood-brown with obscure liver-brown marks. She wants the dark-brown and green colours of the head, rump, and tail coverts, the white of the neck, breast, sides of the rump, and scapulars, and also the orange-brown of the belly. The lesser coverts are slightly glossed with berlin-blue, and the speculum is less vivid than in the male. Length 21 inches 6 lines, &c. (Richardson.) The weight is about 22 ounces.

Temminck states that the young males in autumn, and the old males during their moult, have some of the feathers proper to the winter plumage of the male, and others peculiar to the female, or to the young male before the moult, and that these feathers are indistinctly mingled. Young and old males in the summer change are supposed to be the origin of *The Red-breasted Shoveler*.

The trachea of the male is of equal diameter, except towards the lower larynx, where it is very slightly enlarged. It forms a slight bony protuberance on the left side, which is dilated a little below. The bronchiæ are very [illegible] (Temminck.)

Localities.—Marshes, lakes, and rivers; in Russia, [illegible] a great part of Asia. Very abundant in Holland. In France, Germany, and England, it is a bird of passage, arriving in the British islands generally about October, and departing about March. In England the principal resorts of this species are the fens of Lincolnshire and Cambridge. Bonaparte (Specchio Comparativo) notes it as one of the birds common to the neighbourhoods of Rome and of Philadelphia, and as being rather common in both places in winter. For its American distribution see *Geographical Distribution.*—According to Latham it inhabits the Coromandel coast and parts of India. The form occurs in Australia (New Holland Shoveler); and Swainson says that the geographical distribution of the true Shovelers may be deemed universal.

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* See also '*Localities*' under each genus, and the lists of Col. Sykes and Mr. Keith Abbott, towards the end of the article.

Food.—Fishes and insects, rarely plants and seeds. (Temminck.)

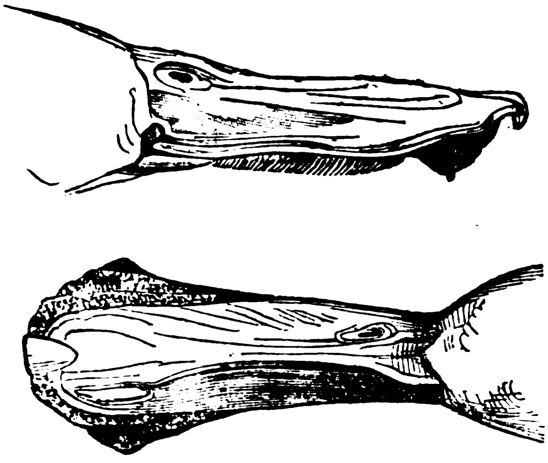
Propagation.—Nest upon the borders of lakes covered with reeds or coppice. Eggs, twelve to fourteen, of a bright greenish yellow, or oil-green. It is said to have bred in France, and has been known to breed in the marshes of Norfolk, and in the neighbourhood of the Tweed. But these may be deemed exceptions to the general place of nidification, which is far north.

Utility to man.—The flesh is highly esteemed for the table, and is considered by many to excel that of the mallard, or common wild-duck, in flavour.

Shoveler. Anas clypeata.

Malacorhynchus (Swainson).

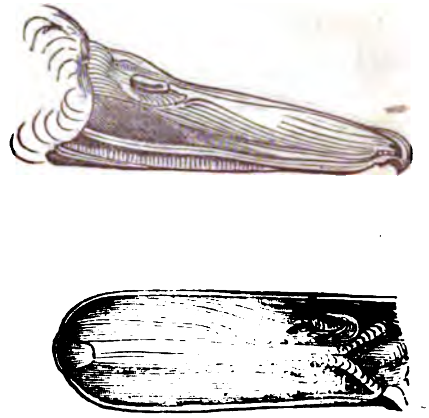
Mr. Swainson ('Journal of the Royal Institution,' loc. cit.) observes that among the broad-billed ducks of the southern hemisphere there is a very remarkable modification of form. The breadth of the bill and the length of the laminæ are nearly the same; but the edge of the upper mandible, instead of being smooth, as in the European species, is furnished with a thin membranaceous skin, which projects considerably, and hangs down somewhat like a wattle on each side. Mr. Swainson proposes for this form the sub-generic name above given, remarking that the bill of the European Shoveler is flexible, but that in this group it is much more so. One species, he adds, described by authors under the name of the Soft-billed Shoveler, can scarcely exhibit this debility more than another before him when he wrote his paper: it came, according to him, from the same country (Australia?) and seems to be undescribed.



Bill of Malacorhynchus. (Swainson.)

Chauliodus (Swainson).

Mr. Swainson states that the Gadwall certainly makes as near an approach to the Shovelers as any other yet known. 'The form of the bill, indeed, is no longer spatulate, or perceptibly broader towards the end; but the laminæ of the upper mandible are still very fine, distinct, and more numerous than those of any other form subsequently mentioned, for they project a full tenth of an inch beyond the margin. The tail now begins to be lengthened, and, in a new species from Africa (*C. Capensis*), which I have recently received, is so much attenuated, as to evince an evident affinity to the Pintail Duck forming the sub-genus *Dafila* of Dr. Leach.'



Bill of Chauliodus (Gadwall). (Swainson.)

Example. *Chauliodus strepera* (Swainson). *The Gadwall*, or *Gray*. This is the *Chipeau*, or *Ridenne*, of the French, *Anitra montanara* and *Anatra canapiglia* of the Italians, *Schwatterente* and *grave Mittel-ente* of the Germans, and *Y gors Hwyad lwyd* of the antient British.

Description of a *male* killed on the Saskatchewan, May 22, 1827. *Colour.*—Top of the head and nape liver-brown, edged with grey; head beneath and neck, grey, with small brown specks. Base of the neck above and below, anterior part of the back, exterior scapulars, flanks, and sides of the vent, clove-brown, marked with concentric horse-shoe-shaped white lines. Interior scapulars, lesser coverts, primaries, tertiaries, and tail, hair-brown; intermediate coverts chestnut-brown; greater coverts, rump, and upper and under tail-coverts, bluish-black; *speculum* white, its anterior border black. Lower part of the breast, middle of the belly, and under surface of the wings, white. *Bill*, brownish-black, pale beneath. *Legs* orange-coloured.

Form.—*Bill* as long as the head, of equal breadth and height at the rictus; depressed, but not widening anteriorly. Laminæ of the mandibles rather stronger and much shorter than those of the Shoveler, but finer and more numerous than those of any northern species. The upper ones project a full tenth of an inch beyond the margin. *Wings* nearly equal to the tail; first and second quills equal and largest. *Tail* consisting of sixteen feathers, the lateral ones graduated. Total length twenty-three inches, &c. (Richardson). Size rather less than that of the wigeon. Temminck makes the length eighteen or nineteen inches. The *female* has the feathers of the back of a blackish-brown, bordered by bright ruddy (*roux*); the breast reddish-brown, marked with black spots; no zigzags on the flanks; rump and lower coverts of the tail greyish.

Localities.—The marshes, &c., of the north and east of Europe; very abundant in Holland. Rarely seen in the British islands except at the period of its vernal migration, and then generally in the marshes of Norfolk. Common in winter on the maritime coasts of France; rare in the interior. Bonaparte (*Specchio Comparativo*) notes it as rather common in the neighbourhood of Rome in the winter. For its American range see the general *Geographical Distribution.*

Food.—Fishes, molluscs (coquillages), insects, and aquatic plants (Temminck). Insects and their larvæ, aquatic plants, and seeds (Selby).

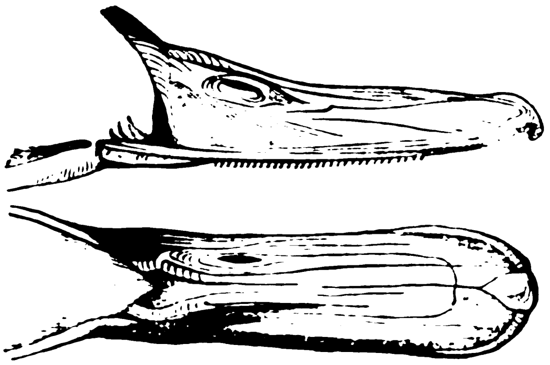
Propagation.—Nest in the most covered part of marshes or rushy meads. Eggs eight or nine, of a greenish ash (Temminck); ten to twelve, of a pale oil-green (Selby).

Utility to man.—Flesh excellent.

N. B. The trachea of the male is slightly enlarged in its diameter at about two-thirds of its length, but becomes narrower as it approaches the lower larynx: this consists of a large bony arch, with a globular, or rather pyriform, bladder attached to the left side, being in shape much like that of the common mallard, but smaller.

Gadwall. Chauliodus strepera.

Dafila (Leach).



Bill of Pintail Duck. (Swainson.)

Mr. Swainson observes that nature has now so far receded from the typical form that one of the chief peculiarities of that structure is nearly lost, and another considerably modified. The laminæ of the upper mandible, which, in *Chauliodus strepera*, are so much shorter than those of the true Shovelers, and are so much abbreviated in *C. Capensis*, become almost concealed by the margin of the bill in *Dafila*. 'The most striking characteristic therefore of the genus we are now considering,' continues Mr. Swainson, 'has nearly disappeared, precisely in that form which is furthest removed from the type. But the shape of the bill, although essentially modified, has not undergone a total alteration: its breadth towards the tip is not only as great as at the base, but is even more dilated; so that in this respect it resembles the Shovelers more than the Gadwalls, while it differs from both in being higher at its base, considerably more lengthened in proportion, and much more convex throughout. It assumes, in short, a semi-cylindrical form, the end being particularly obtuse and slightly dilated; the precise point of junction between the Pintails and that group which was known to the antients by the name of *Boschas*.'

Example. *Dafila caudacuta*. *The Pintail Duck*. This is *Le Canard à long Queue* ou *Pilet* of the French; *Anatra codilanza* and *Anatra di coda lunga* of the Italians; *Spiessente* and *Fusan Ente* of the Germans; *Aler*, *Ahlvogel* of the Fauna Suecica; Sea Pheasant, or Cracker, of Willughby; *Keenegго yaway-sheep* of the Chippeway Indians; *Hwyad gynffonfain* of the antient British; *Anas caudacuta* of Ray; *Anas longicauda* of Brisson; *Anas acuta* of Linnæus; *Querquedula acuta* of Selby.

Description of a male killed on the Saskatchewan, May, 1827. *Colour.—Head* and adjoining part of the *neck* anteriorly umber-brown, with paler edges; neck above blackish-brown; the whole of the back, shorter scapulars, sides of the breast, and flanks, marked with fine waved transverse lines of brownish white and black, most regular and [illegible] on the long feathers lying over the thighs: long scapulars and tertiaries black, the borders of the former and outer webs of the latter white; wing coverts and primaries hair-brown; the primary shafts white, and the interior coverts mottled with the same; *speculum* dark-green, with purple reflections, bounded above by a ferruginous bar and interiorly and below by white. *Tail*, and most of its upper coverts, dark-brown with pale borders. Two long central upper coverts, vent, and under coverts, black; the latter bordered with white. A lateral streak on the upper part of the neck, the sides and front of its lower part, the breast, and belly, white. The posterior part of the abdomen minutely marked with grey. *Bill* black; sides of the upper mandible bluish-grey. *Feet* blackish-grey.

Form.—Bill much lengthened, fully as long as the head, considerably higher than wide at the base; the upper mandible of equal breadth to the point; the *laminæ* not projecting beyond the margin. *Wings* two inches shorter than the tail. Scapulars, tertiaries, tail-feathers and their coverts, tapering and acute; the middle pair of tail coverts having long slender points that project two inches and a half beyond the tail. *Tail* graduated. *Tracheal dilatation*, a small osseous sac, the size of a hazel-nut. Total length [illegible] inches 6 lines (Richardson). Selby observes that the labyrinth of this species consists of a round long bladder, situated on the left side of the arch of the lower larynx; its upper surface being nearly even with the top of the arch, but its lower one reaching much below it. Its texture very fine, and, in young birds, may be indented by slight pressure; but becomes brittle in adults. The weight of the bird is about 24 ounces.

The *female* is smaller. Forehead and crown pale chestnut-brown, streaked with black. Cheeks and neck pale ochreous yellow, speckled with black. Chin and throat pale cream-yellow. Sides of the breast hair-brown, barred and tipt with white. Mantle and scapulars amber-brown, barred and varied with pale buff-orange and white. Tertiaries hair-brown, margined with white. Lesser and greater wing-coverts pale broccoli-brown, edged and tipped with white. Speculum hair-brown, glossed with green, the feathers having white tips. Quills hair-brown. Tail deep hair-brown, with imperfect bars of white and pale buff-orange; the two middle feathers exceeding the rest in length about half an inch. Belly and abdomen yellowish-white, indistinctly marbled with broccoli-brown. Under tail-coverts white, speckled with chestnut-brown of different shades. Bill greyish-black. Legs and toes grey, tinged with brown. (Selby.)

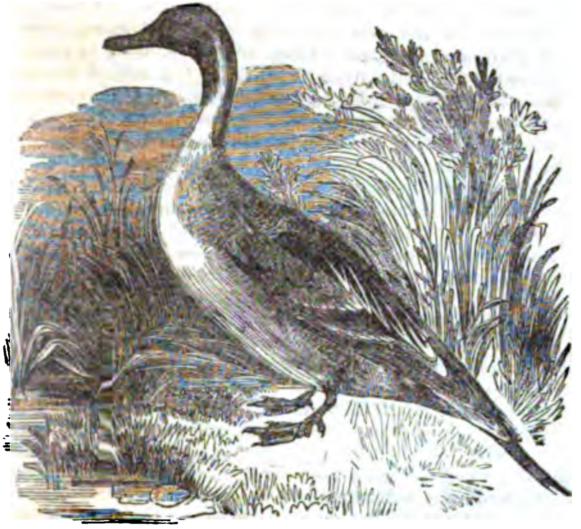
Young Males.—Head red-brown, spotted with black; belly yellowish, and the speculum of a green, inclining to olive, without reflections.

Selby remarks, that like many other of the *Anatidæ* (particularly of the species belonging to this group), the plumage of the male Pintail, towards the end of summer, or after the sexual intercourse is completed, undergoes a remarkable change, and becomes very like that of the female. This appears to be an actual change of the colour in the feathers rather than a renewal of them; and the same change, he adds, is observable in the mallard, and the males of the Teal, Wigeon, &c. It also prevails, if not in all, at least in some species of the genus *Mergus*, as be noticed it in *Mergus serrator*.

Localities.—The north of Europe and America; very numerous at its double passage in Holland and in France; equally abundant in Germany: in winter in the [illegible] (Temminck). Selby says 'it is with us a regular winter visitant; and considerable numbers are annually taken in the decoys of Lincolnshire, Norfolk, &c. Montagu says that it is most abundant in the north of England and Scotland, and especially in the Orkney Islands. This assertion, however, I must in part contradict, as the result of [illegible] observation tells me it is of *rare occurrence* in the *northern counties* of England; and the same may be said of the southern districts of Scotland, which Dr. Fleming confirms in his history of British animals. With respect to the Orkneys, I cannot speak so confidently, although it appears probable that what had been represented to him as the present species was in fact the Long-tailed Duck (*Harelda glacialis*), which is found in great numbers during the winter in the bays of this group of islands. The Pintail has a wide geographical range, being met with in all the northern parts of Europe, Asia, and America, and retires in the summer to breed in high latitudes. Its equatorial migration extends as far as Italy; and during its periodical flight to the southward it occurs abundantly in Holland, France, Germany, and other continental states. The marshes of the interior part of the country, and fresh-water lakes are its usual places of resort.' Pennant states that Mr. Hartlib, in the appendix to his 'Legacy,' tells us that these birds are found in great abundance in Connaught in Ireland, in the month of February only, and that they are much esteemed for their delicacy. C. L. Bonaparte (*Specchio Comparativo*) notes it as not very rare in the winter near Rome. See above, *Geographical Distribution*.

Food.—Similar to that of the Gadwall (Temminck). Selby says that its food consists of insects and their larvæ, the seeds of aquatic plants, particularly of some species of *Epilobium*, and vegetables.

Propagation.—The season of courtship is indicated in the male by suddenly raising himself upright in the water, bringing his bill close to his breast, and uttering at the same time a low soft note. This gesticulation is often followed by a jerk of the hinder part of the body, which is then also thrown above the water. *Nest*, in rushes and the thick herbage of marshes. Eggs, from eight to ten, bluish-white (Selby); eight or nine, greenish-blue (Temminck).

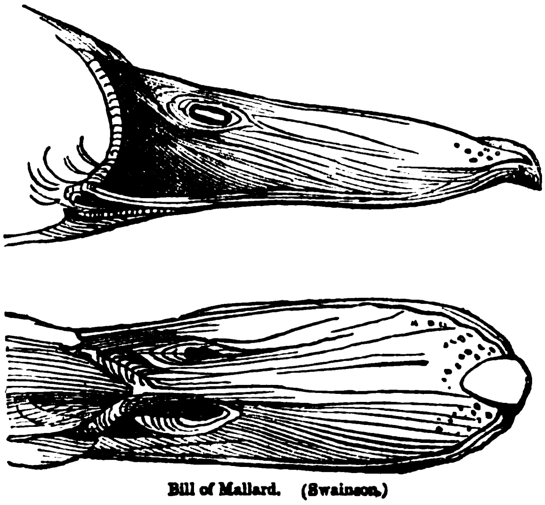


Pintailed Duck. Dafila caudacuta.

Hybrids, &c.

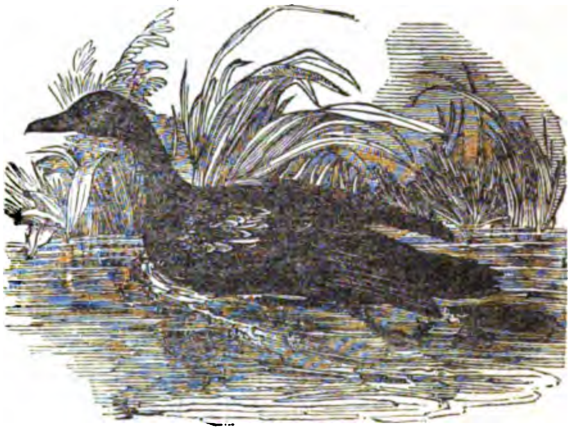
Selby observes that the Pintail is easily domesticated, but rarely breeds in confinement. A hybrid progeny has been produced between it and the Wigeon; and, to such an extent do the sexual propensities seem to be affected in this state, by difference of food and other causes, that Montagu mentions a male Pintail in his menagerie which, for want of the other sex, showed an inclination to pair with a female Scaup, and even with a Bernicle Goose. He further adds, that one of them did pair with a tame duck, but that none of the eggs (upwards of twenty in number) proved to be fecundated.

Bosch

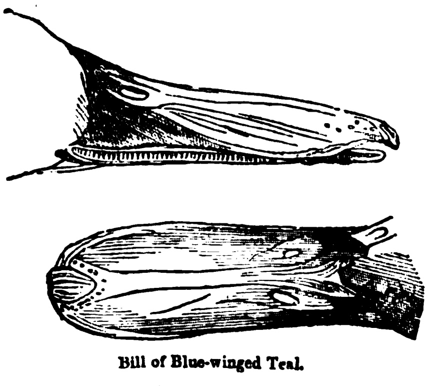


Bill of Mallard. (Swainson.)

Mr. Swainson (*Journal of the Royal Institution*) comprehends under this sub-genus all those ducks usually denominated Teals, together with the mallard, long domesticated in our poultry-yards. 'As this,' continues Mr. Swainson, 'is by far the most numerous group, so it exhibits a greater diversity of form among the species. They are all however characterized by a bill *longer than the head*, whose breadth is equal throughout; it is sometimes indeed a little dilated, but never contracted at its tip, while the laminæ of the upper mandible are entirely concealed by the margin of the bill. The neck and the tail, which in *Dafila* are both considerably lengthened, are much shorter in this group, which is further distinguished by the brightness and beauty of plumage observed in nearly all the species. On comparing the bill of the common Teal with that of the Pintail, we see a close affinity between the two forms. But as the tail of the first is so much developed in comparison to that of the Teal, it becomes essential to discover, if these sub-genera actually followed each other in nature, what species united them more closely. By the uniform liberality of the zoologists attached to the British Museum, and more particularly J. E. Gray, Esq., I am now enabled to do this. The beautiful *Anas* (*Boschas*) *formosa*, Sw., or Baikal Teal of methodists, is precisely a bird which intervenes between these two sub-genera. Essentially a Teal, it differs from all others I have yet seen in the superior length of its tail, the feathers of which are a full inch longer than the under-covers;[*] while the convexity of the bill, from being greater than in the common Teal, establishes its close approximation to *Dafila*. Proceeding thus by analysis, we find several foreign species which may be either called Teal or Ducks. The *Boschas Javensis*, Sw., is more especially a bird of this description. It is closer allied to the mallard than to any other of the group: this is indicated by the more depressed form of the bill, and the white collar round the neck; the nape also is very conspicuously crested, a peculiarity found in no other group of the genus. To this and to the curled tail of the tame duck we shall presently advert. Having now reached what appears to be the typical form of *Boschas*, we see that nature as usual again departs from it. The bill of the mallard is throughout more depressed than that of the common Teal. This depression in fact, from being



Blue-winged Teal. Boschas discors.



Bill of Blue-winged Teal.

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[*] In *Anas* (*Boschas*) *Crecca* the tail is so short, that the under-covers reach almost to the middle of the tip of the middle tail feathers.

greater than that of the Gadwall, or of the Pintail, obviously assimilates more to the Shoveler. The affinity however appears remote, since the laminæ of the mallard are concealed, while those of the Shovelers are conspicuously projecting. If therefore the affinity was immediate, it could only be demonstrated by a species having the bill of the common duck, but with the laminæ projecting. Now such a species is actually the blue-winged Teal of North America, in which these laminæ project nearly as much as in the Gadwall, while the upper mandible exhibits that peculiar sinuosity towards the base which is seen in no other ducks besides the Shovelers. If this affinity required any further support, it is placed beyond doubt by the fact mentioned in the 'General History of Birds,' that the plumage of the New Holland Shoveler, excepting the white facial crescent, is precisely the same as that of the blue-winged Teal,—the very bird which thus unites the sub-genus *Boschas* to that of *Anas*, and completes the circle of the whole group.'

Of the sub-genus *Boschas*, the common mallard or wild duck, *Boschas domestica*, may be selected as an example. Both sexes of this beautiful bird are so well known that either description or figure would be superfluous. It is the *Canard sauvage* of the French; *Capo verde* (the male), *Anitra* (the female), *Germano*, and *Paperone* of the Italians; *Wilde Ente* and *Gemeine Ente* of the Germans; *Ethinneesen sheesheep* of the Cree Indians; Stock-Duck of the Hudson's Bay residents; and *Cors Hwyad*, *Garan Hwyad*, and *Hydnwy* of the antient British.

The weight of the wild mallard is usually about two pounds and a half. The abundance of the bird at one time in Britain may be judged of from the following passage in Pennant:—'Amazing numbers of ducks, wigeons, and teals are taken: by an account sent us of the number caught, a few winters past, in one season, and in only ten decoys, in the neighbourhood of Wainfleet, it appeared to amount to 31,200, in which are included several other species of ducks; it is also to be observed, that, in the above particular, wigeon and teal are reckoned but as one, and consequently sell but at half the price of ducks. . . . The account of the numbers here mentioned relates only to those that were sent to the capital. It was customary formerly to have in the fens an annual *driving* of the young ducks before they took wing. Numbers of people assembled, who beat a vast tract, and forced the birds into a net placed at the spot where the sport was to terminate. A hundred and fifty dozens have been taken at once; but this practice being supposed to be detrimental, has been abolished by act of parliament.' Selby observes upon this that the same district at the present time does not produce perhaps a dozen broods in the year.

Mr. Waterton has pointed out that the duck and the drake are clothed in the same plumage only for a very short time in the summer. Mr. Selby's observations on the change of plumage are referred to under the account of the Pintail.

The trachea of the mallard has at its lower extremity a labyrinth much larger than that of the gadwall, but not unlike it; the tube does not differ much in diameter throughout its length. In the museum of the Royal College of Surgeons, in London (Physiological series, gallery, No. 1124), are the termination of the trachea, inferior larynx, bronchiæ, and lungs of a drake. (*Anas Boschas*, Linn.)

Localities.—The wild duck is widely spread over a considerable portion of the globe. Few of the temperate and arctic regions are without it. Temminck places its habitation in the northern countries, and observes that 'it is known as a bird of passage nearly throughout Europe, haunting rivers, lakes, and marshes. C. L. Bonaparte (Specchio Comparativo) mentions it as very common near Rome in winter. For its American range, see *Geographical distribution* above.

Food.—Fishes, fry or spawn, slugs, water insects, aquatic plants, their seeds, and all sorts of grain (Temminck)—insects, worms, slugs, and all kinds of grain, &c. (Selby.)

Propagation.—'In a natural state,' says Selby, 'wild ducks always pair, though in a state of domestication they are observed to be polygamous. The pairing takes place towards the end of February or beginning of March, and they continue associated till the female begins to sit, when the male deserts her, joining others of his own sex similarly situated; so that it is usual to see the mallards, after May, in small flocks by themselves. About this time also they begin to undergo the changes of colour that assimilate them in a great degree to the female, and which is retained till the period of the autumnal or general moult. The care of the young thus devolves entirely upon the duck, and is not partaken by the male, as Wilson and others appear to think; and this fact I have had frequent opportunities of verifying, as many wild ducks annually breed upon the edges of our Northumbrian moors, and the young broods are of course frequently under inspection as they descend the rivulets to the lower marshy parts of the country. The nest of the wild duck is generally made in some dry spot of the marshes, and not far from water, to which she can lead her progeny as soon as hatched. It is composed of withered grass and other dry vegetable matter, and usually concealed from view by a thick bush or some very rank herbage, though other and very dissimilar situations are occasionally chosen, as several instances have been recorded where they have deposited their eggs on the fork of a large tree, or in some deserted nest. Such an instance once occurred within my knowledge, and near my own residence, where a wild duck laid her eggs in the old nest of a crow, at least thirty feet from the ground. At this elevation she hatched her young; and as none of them were found dead beneath the tree, it is presumed she carried them safely to the ground in her bill, a mode of conveyance known to be frequently adopted by the Eider Duck.' Montagu (*Ornith. Dict., Suppl.*) says, 'we have been assured by a person of undoubted veracity that a half domesticated duck made a nest in Rumford Tower, hatched her young, and brought them down in safety to a piece of water at a considerable distance. Others have been known to breed in trees: and we recollect the nest of this bird being found in the head of an old pollard willow, impending the water, from whence the young might readily drop unhurt into their natural element. Mr. Tunstall mentions one at Etchingham, in Sussex, which was found sitting upon nine eggs, on an oak-tree, twenty-five feet from the ground: and the author of the 'Rural Sports' records an instance of one taking possession of the nest of a hawk in a large oak. To these we can add, upon the testimony of a gentleman of the strictest veracity, that out of a large flock of half-domesticated ducks, one deposited her eggs in the principal fork of a large tree near his house.' Eggs, ten to fourteen, of a bluish-white; the female, when she quits the nest for food, covers them with down and other substances.

Our limits will not allow us to detail the different methods of taking the wild duck, and we must refer the reader to the works of Willughby, Pennant, and Bewick, for descriptions of the decoy, the latter furnished by Mr. Bonfellow; to those of Wilson and others, for various modes of capture; and to Col. Hawker's well-known book, for the modes of hut-shooting, &c., and some particulars relating to decoys.

In a domesticated state it is most widely distributed. All the varieties that the fancy of the breeder can produce are to be seen in the various poultry-yards. To say nothing of the Aylesbury and other breeds, where size and delicacy of flesh have been principally considered, we find penguin ducks standing nearly erect, hook-billed ducks, and even a variety where the caprice of man has succeeded in nearly obliterating the webs of the feet and curtailing the bill till it has lost its spatulate shape and is become a deformity, bearing some resemblance to the bill of a common fowl. Some of these birds have been shown as the offspring of a cock and a duck, we need hardly say, without the slightest foundation for the monstrous assertion. Selby observes that in the domesticated varieties the peculiar specific distinction of the curled feathers of the tail is still retained. In China and the other countries of the East, numbers of ducks are hatched by artificial means.

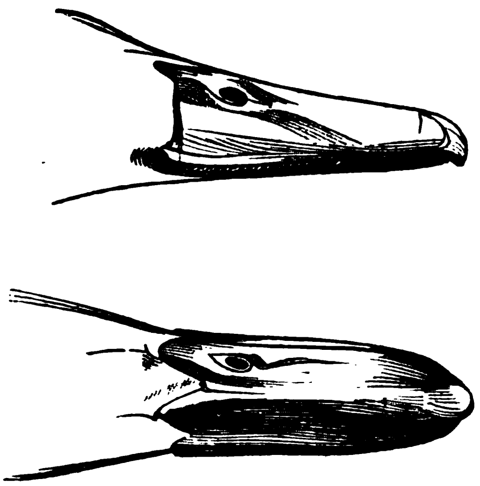
HYBRIDS.

Latham states that the male Muscovy duck and common duck will breed together. The young bear a greater resemblance to the common duck than to the Muscovy duck.

In 'Fauna Boreali Americana' Mr. Swainson places the genera *Mareca* and *Dendronessa* in his sub-family *Anatinæ*.

Mareca. (Stephens.)

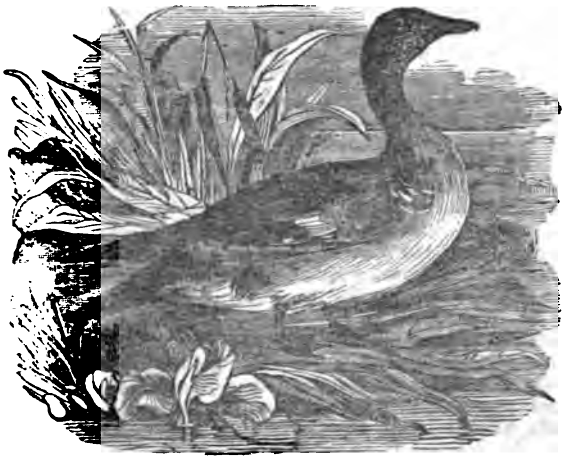
Selby says that the wigeons are distinguished from the teals by a much shorter and less cylindrical bill; and from the ducks, by that member becoming more contracted and narrow, instead of widening towards its tip. The laminæ of the bill are also broader and set wider apart, approaching a form nearer to those of the sub-family *Anserina*. These birds, he adds, also vary in their habits, for instead of searching and sifting the mud with their bills for insects, seeds, &c., upon which food most of the other genera live, they subsist principally on grasses and vegetable diet, which they pluck in the same manner as geese. Their flight is strong and swift, and they have a peculiar shrill whistling call note. In the shape of the tracheal labyrinth they resemble the Pintail more than any other species: the middle feathers of the tail are also acute, and considerably longer than the rest.



Bill of Wigeon.

Example, *Mareca Americana* (Stephens), *American Wigeon*. This is the *Anas Americana* of Gmelin and of Sabine, in Franklin's Journal, and *Atheekemow-weeshep* of the Cree Indians.

Description of a *male* killed on the Saskatchewan, May, 1827 (Richardson). *Colour.*—A white band from the forehead to the nape, bounded behind the eye by a broad dark-green patch, which ends in the nuchal crest. Upper part and sides of the breast brownish-red, glossed with grey. Base of the neck above, interscapulars, scapulars, and flanks, minutely undulated with brownish-red and black; hind part of the back undulated in a similar manner with clove-brown and white, the latter colour prevailing on the tail-coverts. Lesser wing-coverts, primaries, and tail, clove-brown; intermediate and greater coverts, sides of the rump, breast, and belly, pure white. *Speculum*, velvet-black below, duck-green above, bounded superiorly with black and posteriorly with white. Exterior webs of the tertiaries, and lateral and inferior tail-coverts, greenish-black, the first bordered with white. *Bill*, bluish-grey, bordered and tipped with black.



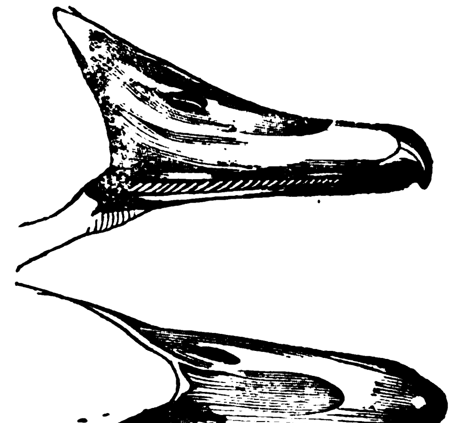
Mareca Americana.

Form.—Bill particularly short, being not so long as the head, armed with *laminæ* resembling those of the mallard. Plumage of the *nape* somewhat lengthened. *Wings*, above an inch shorter than the acutely-pointed tail, which consists of fourteen feathers. Total length, 23 inches.

The *female* has the upper plumage dark liver-brown, edged and remotely barred with pale-brown and white. The intermediate wing-coverts are merely edged with white, and there is no green on the head. *Tail*, shorter and not so tapering. Total length about two inches less than the male.

Localities, Propagation, Habits, &c.—Wilson says that it is very common in winter along the whole coast from Florida to Rhode Island; but most abundant in Carolina, where it frequents the rice plantations. In Martinico great flocks take short flights from one rice-field to another during the rainy season, and are much complained of by the planters. They are said to be in great plenty at St. Domingo and Guiana, where they are called vingeon or gingeon. Are said sometimes to perch on trees. Feed in company (but little in the day), and have a centinel on the watch. Come out from their hiding-places in the evening. Are not known to breed in any part of the United States. Are common in the winter months along the bays of Egg Harbour and Cape May, and also those of the Delaware. They leave their places in April, and appear upon the coast of Hudson's Bay in May, as soon as the thaws come on, chiefly in pairs; lay there only from six to eight eggs, and feed on flies and worms in the swamps; depart in flocks in autumn. (Wilson here quotes Hutchins.) Wilson further states, that the wigeon is extremely fond of the tender roots of that particular species of aquatic plant on which the Canvass-back duck, so abundant in Chesapeak Bay, feeds. The wigeon is its constant companion; and the wigeon, which never dives, watches the moment of the Canvass-back's rising with the morsel for which the latter bird has dived, and before he has his eyes well opened, snatches it and makes off. On this account the Canvass-backs and wigeons, or, as they are called round the bay, *Bald Pates*, live in a state of perpetual contention.

Dendronessa (Swainson).



Bill of Summer Duck.

Head crested. *Bill* as high at the base as it is broad; towards the tip narrow and contracted. *Nostrils* placed towards the middle of the bill. *Tertial feathers* ornamented. *Feet* as in *Anas*. Type *Dendronessa galericulata*, *Chinese Teal*. Edwards, pl. 102.

Mr. Swainson, who thus characterizes the genus, observes ('Fauna Boreali Americana') that 'this is obviously the rasorial type of the *Anatinæ*. The *D. Sponsa*, by the lateral advancement of the bill towards the eye, is a more aberrant species, and shows the connection of the group to *Somateria*.'

Example. *Dendronessa Sponsa* (Swainson), *the Summer Duck*. This is the *Wood Duck* of Audubon, *Ansce-aumo* of the Chippeways, *Anas Sponsa* of Linnæus.

Description of a *male*, killed at Cumberland House, lat. 54°; June, 1827. *Colour.*—Head above and space between the eye and bill glossy dark-green; cheeks and a large patch on the sides of the throat purple, with blue reflections; pendent occipital crest of green and auricula purple, marked with two narrow white lines, one of them terminating behind the eye, the other extending over the eye to the bill; sides of the neck purplish-red, changing on the front of the neck and sides of the breast to brown, and there spotted with white. Scapulars, wings, and tail exhibiting a play of duck-green, purple, blue, and velvet-black colours; interscapulars, posterior part of the back, rump, and upper tail-coverts blackish green and purple; several of the lateral coverts reddish-orange; a hair-like, splendent, reddish-purple tuft on each side of the rump; the under coverts brown. Chin, throat, a collar round the neck, a crescentic bar on the ears, the middle of the breast, and whole of the abdomen, white. Flanks yellowish-grey, finely undulated with black; the tips of the long feathers, and also those on the shoulder, broadly barred with white and black. Inner wing-coverts white, barred with brown. Almost all the coloured plumage shows a play of colours with metallic lustre. *Bill* red; a space between the nostrils, its tip, margins, and lower mandible, black. *Legs* orange-coloured.

Summer Duck. Dendronessa Sponsa. Male

Form.—*Bill* shorter than the head; considerably narrowed towards the tip, like that of the Eider; its height at the rictus greater than its width; its frontal angles prolonged. *Mandibles* strongly toothed. *Unguis* strong, arched or hooked. *Nostrils* large, pervious, lateral. *Forehead* sloping. *Occipital crest* long and pendent. *Wings* shorter than the tail, which consists of sixteen wide rounded feathers. Total length 21 inches.

The *female* wants the fine lines on the flanks and the hair-like tufts on the sides of the rump. She has a shorter crest; and the plumage is less vivid, especially about the head, where it is mostly brown. (Richardson.)

Localities.—Audubon states that this species ranges over the whole extent of the United States, and that he saw it in all parts, from Louisiana to the confines of Maine, and from the vicinity of the Atlantic coasts as far inland as his travels extended. It also occurs sparingly during the breeding season in Nova Scotia; but further north he did not observe it. Everywhere in this immense tract he found it an almost constant resident; for some spend the winter even in Massachusetts, and far up the warm spring waters of brooks on the Missouri. It confines itself, however, entirely to fresh water, preferring at all times the secluded retreats of the ponds, bayous, or creeks, that occur so profusely in the woods. Well acquainted with man, they carefully avoid him, unless during the breeding season, when, if a convenient spot is found by them, they will even locate themselves about the miller's dam.

Habits, &c.—Our limits will not permit us to insert Audubon's interesting account of the general habits, food, &c. of the Summer Duck. (See *Ornithological Biography*, vol. iii., p. 52, &c.)

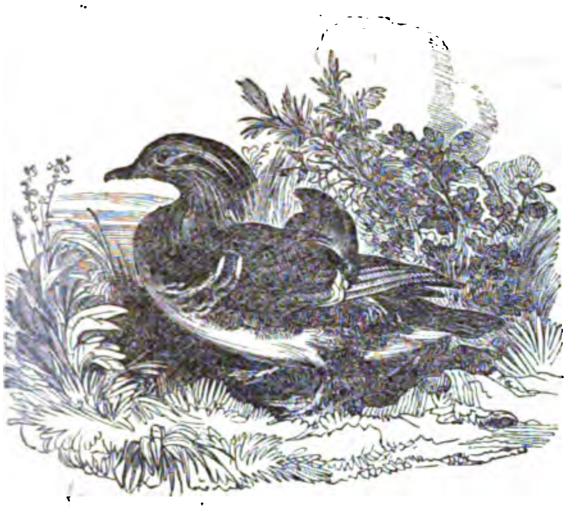
Chase.—See the same work.

Propagation.—Catesby says that the Summer Ducks breed in Virginia and Carolina, and make their nests in the holes of tall trees (made by woodpeckers) growing in water, particularly cypress trees. 'While they are young and unable to fly, the old ones carry them on their backs from their nests into the water; and at the approach of danger they fix with their bills on the backs of the old ones, which fly away with them.' Audubon's evidence, which we here give, differs from that of Catesby in some particulars. 'The Wood Duck breeds in the Middle States about the beginning of April, in Massachusetts a month later, and in Nova Scotia or on our Northern Lakes seldom before the first days of June. In Louisiana and Kentucky, where I have had better opportunities of studying their habits in this respect, they generally pair about the 1st of March, sometimes a fortnight earlier. I never knew one of these birds to form a nest on the ground or on the branches of a tree. They appear at all times to prefer the hollow broken portion of some large branch, the hole of our largest woodpecker (*Picus principalis*), or the deserted retreat of the fox-squirrel; and I have been frequently surprised to see them go in and out of a hole of any one of these, when their bodies while on wing seemed to be nearly half as large again as the aperture within which they had deposited their eggs. Once only I found a nest (with ten eggs) in the fissure of a rock on the Kentucky River, a few miles below Frankfort. Generally, however, the holes to which they betake themselves are either over deep swamps, above cane-brakes, or broken branches of high sycamores, seldom more than 40 or 50 feet from the water. They are much attached to their breeding places, and for three successive years I found a pair near Henderson, in Kentucky, with eggs in the beginning of April, in the abandoned nest of an ivory-billed woodpecker. The eggs, which are from six to fifteen, according to the age of the bird, are placed on dry plants, feathers, and a scanty portion of down, which I believe is mostly plucked from the breast of the female. They are perfectly smooth, nearly elliptical, of a light colour between buff and pale green, two inches in length by one and a half in diameter; the shell is about equal in firmness to that of the mallard's egg, and quite smooth. No sooner has the female completed her set of eggs than she is abandoned by her mate, who now joins others, which form themselves into considerable flocks, and thus remain apart until the young are able to fly, when old and young of both sexes come together, and so remain until the commencement of the next breeding season. In all the nests which I have examined, I have been rather surprised to find a quantity of feathers belonging to birds of other species, even those of the domestic fowl, and particularly of the wild goose and wild turkey. On coming upon a nest with eggs when the bird was absent in search of food, I have always found the eggs covered over with feathers and down, although quite out of sight in the depth of a woodpecker's or squirrel's hole. On the contrary, when the nest was placed in the broken branch of a tree, it could easily be observed from the ground, on account of the feathers, dead sticks, and withered grasses about it. If the nest is placed immediately over the water, the young, the moment they are hatched, scramble to the mouth of the hole, launch into the air with their little wings and feet spread out, and drop into their favourite element; but whenever their birth-place is at some distance from it, the mother carries them to it one by one in her bill, holding them so as not to injure their yet tender frame. On several occasions, however, when the hole was thirty, forty, or more yards from a bayou or other piece of water, I observed that the mother suffered the young to fall on the grasses and dried leaves beneath the tree, and afterwards led them directly to the nearest edge of the next pool or creek.'

Dendronessa galericulata and *D. sponsa* breed freely in captivity. Both species have produced several broods in the gardens of the Zoological Society in the Regent's Park, where most of the Anatinæ here enumerated may be seen. Our limits not allowing us to describe more than one species of a genus, we must refer the reader to Edwards and others for the description of *D. galericulata*, which he will find stuffed in most of our museums, and, generally, alive in the gardens at the Regent's Park, where he will have an opportunity of studying the oriental and occidental forms of *Dendronessa*, and their habits in a half-domesticated state.

Mr. Yarrell (*Zool. Proc.*, 1830-31) stated to the society that the *Summer Duck, D. sponsa*, male and female, had been shot recently near Dorking.

Lieutenant-Colonel Sykes, in his 'Catalogue of Birds observed in the Dukhun' (Deccan), enumerates the following British *Anatinæ* —*Anas strepera*, Linn., males identical with specimens in the British Museum, from Kent,



Mandarin Duck. Dendronessa galericulata. Male.

females for comparison; numerous in Dukhun; *Rhynchaspis virescens*, Leach, MSS., *Anas clypeata*, Linn.; identical with British specimens of the *common Shoveler*, but differing from the description of that bird in Shaw; *Mareca fistularis*, Steph., *Anas Penelope*, Linn., *Wigeon*, absolutely identical with specimens from Devonshire; *Querquedula Circia*, Steph.; *Anas Circia*, Linn., *Garganey*, identical with British specimens; *Querquedula Crecca*, *Anas Crecca*, Linn., *Common Teal*, identical with male and female British specimens. (*Zool. Proc.*)

Mr. Keith Abbott (*Zool. Proc.*, 1834), in his 'List of Trebizond Birds,' enumerates *Anas Boschas*, Linn., *the Mallard*, as almost universal; and *Anas Querquedula*, Linn., which is noted as inhabiting India as well as Europe, and as common in the Himalayan range.

Fossil Anatinæ.

Dr. Buckland (*Bridgewater Treatise*) mentions and figures the duck *Anas*, (the figure represents the common wild duck), among the land mammifers and birds of the third period of the tertiary series, and he observes that many of the genera there enumerated occur both in the second, third, and fourth formations of the tertiary series, and also in caverns, fissures, and diluvium. Thus, among the remains found in the Kirkdale Cave (*Reliquiæ Diluvianæ*), he enumerates and figures the right coracoid process of the scapula of a small species of duck or wigeon. Dr. Buckland also observes that the eggs of aquatic birds have been preserved in the lacustrine formations of Cournon, in Auvergne. (See Croizet and Jobert, *Recherches sur les Oss. Foss. du Départ. du Puy de Dome, &c.*)

For the rest of the families or subfamilies of the great genus *Anas*, see FuliguliNæ, Geese, Merganinæ, Swans.

DUCLOS, CHARLES PINEAU, was born in the year 1704, at Dinant, in Bretagne, whence he was sent to Paris to prosecute his studies. He soon formed a connection with the wits of the age, and published a Romance called 'Acajon et Zirphile.' This work attained only moderate celebrity; but a subsequent romance, entitled 'Confessions du Comte de * * *,' was more successful. His reputation however depends on a collection of moral essays, published under the title of 'Considérations sur les Mœurs de ce Siècle,' which have been greatly extolled by many writers, and which Louis XV. characterized as 'the work of an honest man.' In 1739 Duclos was admitted into the Academy of Inscriptions, and in 1747 into the Académie Française, of which he became perpetual secretary. The citizens of his native town, to testify their respect for him, made him their mayor in 1744, but he continued to reside at Paris, where he died in 1772.

The romances of Duclos, though less indecent than the works of Crebillon the younger, are sufficiently indelicate to offend persons of refined taste, while they lack the bitter satire and deep knowledge of human nature which characterize that acute though obscene author. With all deference to the opinions of his distinguished contemporaries, we cannot help thinking that his 'Considérations' is but an indifferent performance. They are a series of essays on the opinions which regulate society, and though free from the misanthropic ill-nature which appears in Rochefoucauld and occasionally in La Bruyère, they are deficient in the real depth which those writers exhibit, and want that charm of novelty and originality which is necessary to make mere moral essays palatable. The romances and essays have been collected into four vols., 8vo., under the title of 'Œuvres Morales et Galantes.' Duclos also wrote a history of Louis XI., and a secret history of Louis XIV. and XV., which have acquired some reputation.

DUCTILITY is the property of bodies, and more especially of the metals, which admits of their being drawn out in length, while their diameter is diminished without any actual fracture or separation of their parts; in other words, it is upon this property that the wire-drawing of metals depends. The following is nearly the order of ductility of the metals which possess the property in the highest degree; that of the first-mentioned being the greatest:—gold, silver, platinum, iron, copper, zinc, tin, lead, nickel, palladium, cadmium.

Though the malleability and ductility of metals are connected, they are not always in the same proportion; iron, for example, though extremely ductile, cannot be beaten into very thin laminæ The difference between ductility and malleability has been ascribed to the figure and arrangement of their particles; the malleable metals may be conceived to consist of small plates, and the ductile metals of minute fibres placed beside or over each other; the one slide by their flat surfaces, the other lengthen and exert an adhesion from one extremity to the other.

According to Muschenbroek, a workman of Augsburg drew a grain of gold into a wire 500 feet long; its diameter must have been only 1-4600th of an inch. In the Philosophical Transactions for 1813, Dr. Woollaston has described a method by which he succeeded in obtaining a wire only 1-30,000th of an inch in diameter.

Of a silkworm's thread 300 feet weigh one grain; the same length of a spider's web weighs only 1-35th as much, and consequently 10,500 feet weigh only a grain.

DUDLEY, originally written **DUDELEI**, a market-town and parish in the lower division of the hundred of Halfshire, in the county of Worcester (though locally in the hundred of Offlow, in Staffordshire), 26 miles north-north-east from Worcester, 9 north-west by north from Birmingham, and 127 north-west by north from London.

Dudley owes its origin to Dodo, a Saxon prince, who built here a strong castle, situated on a considerable eminence, about the year 700. In the reign of Henry II. it belonged to Gervase Paganell, and was demolished by that king in consequence of Gervase's taking part in the rebellion of his son, prince Henry. In 1644 the castle was gallantly defended by Colonel Beaumont against the parliament forces for three weeks, when it was relieved by a party of the royal army from Worcester. The remains, consisting of a gateway, the keep, part of the tower, the offices, &c., form a highly interesting ruin.

About half a mile from the town are the ruins of an antient priory of Benedictine monks of the order of Cluny, founded by Gervase Paganell. A mayor and other officers are annually appointed by the lord of the manor, but the town is within the jurisdiction of the county magistrates. The houses are generally neat and well-built, and the streets clean and well paved, and lighted with gas. An extensive subscription library was established in 1805.

The principal trade of Dudley consists in the smelting and working of iron ore, with which the whole neighbourhood abounds, as well as with coal. The articles manufactured are various iron utensils, nails, and glass. In 1831 the coal-mines in the parish employed 500 men; 570 were employed as nailers, and a large number in the iron-works. There are extensive quarries of limestone in the neighbourhood. A tunnel, one mile and three-quarters in length and thirteen feet high, has been cut through the hill on which the castle stands for conveying the limestone under the castle-hill to the kilns. Fairs are held on the 8th of May and 2nd of October, for cattle, cheese, and wool; and on the 5th of August for lambs. Saturday is the market-day.

The population consists of 23,000 persons, the major part of whom are engaged in mining, manufacturing nails, and smelting iron ore. Dudley sends one member to the House of Commons, under the Reform Act.

The living is a vicarage in the diocese of Worcester. There are two churches, St. Thomas and St. Edmund, and a chapel of ease, recently erected. St. Thomas is a handsome building in the modern style of English architecture, with a lofty spire. There are places of worship for Methodists, Baptists, Independents, Unitarians, and the Society of Friends. The free grammar-school was founded by Thomas Wattewood, clothier, of Stafford, and Mark Bysmor, stillworker, of London, and endowed with land by queen Elizabeth, the annual value of which is now above 300*l.* The master receives 200*l.* a year, and the number of scholars averages about 30 or 40. A charity-school for clothing and educating 40 girls, and another charity for clothing seven poor men was established in 1819, by Mrs. Cartwright, in consequence of a legacy left for that purpose by the Rev. Henry Antrobus. A school for clothing and educating 50 boys was founded 1732, and endowed with land by Robert, Samuel, and Ann Baylis. About 200 boys are educated here, exclusively of those on the foundation. There is a blue school, where 230 boys, and a school of industry, where 220 girls are educated. The Unitarians have also a school for girls.

A fossil called the Dudley Locust is found in great quantities and variety of sizes in the limestone quarries in the neighbourhood; it is supposed to be an extinct species of Monoculus. Nash, in his 'History of Worcestershire,' mentions one four inches five-eighths in length, and three inches three-fourths in width.

In the vicinity of Dudley there are several chalybeate springs, as well as a spa well, held in high estimation for its efficacy in cutaneous disorders.

DUEL, a hostile meeting between two persons in consequence of an affront given by one of them to the other, and for the purpose (as is said) of *satisfaction* from the person affronting to the person affronted. Such is a general description of the duel, as now existing in England and other European nations, and in America.

The rise of the present duel, or practice of duelling, is to be referred to the trial by battle which obtained in early ages, jointly with the single combat or tournament of the age of chivalry, which again most probably owed its own existence to the early trial by battle. This trial by battle, or duel (as it was also called), was resorted to, in accordance with the superstitious notions of the time, as a sure means of determining the guilt or innocence of a person charged with a crime, or of adjudicating a disputed right. It was thought that God took care to superintend, and to see that, in every case, innocence was vindicated and justice observed. The trial by battle, or duel, thus viewed, was introduced into England by William the Conqueror, and established in three cases; viz., in the court-martial or court of chivalry, in appeals of felony, and in civil cases upon issue joined in a writ of right. Once established as a mode of trial, the duel was retained after the superstition which had given rise to it had died away, and was resorted to for the purpose of wreaking vengeance, or gaining reputation by the display of courage. Then came the age of chivalry, with its worship of punctilio and personal prowess, its tilts and tournaments; and the duel, originally a mode of trial established by law, became in time (what it now is) a practice dependent on certain conventional rules of honour, or on fashion.

We shall confine ourselves to a consideration of the duel in its present character. This duel takes place, as we have already said, in consequence of an *affront.* In order then to have a complete notion of the present practice of duelling, we must understand what an affront is, and the best way of explaining this word *affront* is the way of enumeration; for were we to content ourselves with saying that an affront is anything which (in the common phrase) hurts a man's feelings, or again, which wounds his honour, we should only be using words which themselves require to be explained as much as the word *affront.* We might as well say at once, forgetting that it is our object to explain the grounds or reasons of a duel, that an affront is anything which is at any time the ground or reason of a duel; for we should give as much and as correct information by this as by either of the preceding explanations.

An affront is considered to be given when one man charges or insinuates against another that he is guilty of a lie, of dishonesty in pecuniary transactions, of cowardice, of hypocrisy, of being actuated by one motive or set of motives when he professes to be actuated by others; when (in the common phrase, which is sufficiently vague and comprehensive), one man imputes motives to another; when he indulges in expressions of contempt, or what is styled personal and virulent abuse; and also when one man impugns or disparages, in any of the above-mentioned ways, the character of some relative or intimate friend of another man. An insult or injury to a female relative in particular, or to a female companion, such as a partner in a ball-room, is always accounted a great affront. Sometimes even the simple fact of success in an amatory affair is construed by the unsuccessful rival as an affront, and he who has succeeded is called upon for satisfaction. Such are the principal affronts which, according to custom or fashion (or as it is also called) the law of honour, are, at different times, reasons or grounds for fighting a duel.

When any one of these affronts has been given by one man to another, it is the custom or fashion for this last to call on the affronter to retract, explain, or apologize for (as the case may be) that which constituted the affront, or (in significant phrase) to give the usual satisfaction.—The satisfaction (as it is also sometimes circumloquized) which one gentleman expects from another. He at the same time usually names some friend, in whose keeping (to use the fashionable phrase) he places his honour, and to whom the affronter is to address any communication. This call or challenge having reached its destination, and the affronter being unable or unwilling to retract, explain, or apologize, he too singles out a friend to whom he likewise entrusts his honour; the two friends or seconds (as they are called) then make arrangements for a meeting between the affronter and the person affronted, or (varying the expression) the challenger; they fix the time and place, and get ready the weapons; the meeting takes place; the word *fire* is uttered, according to a previous agreement between the seconds, the hostilities commence, and they proceed until one of the parties either fires in the air, or is killed or wounded, or until the seconds interfere to stop them. The parties, or rather so many of them as are alive, then leave the ground satisfied; the principals (if both are alive) sometimes shaking hands with one another, to denote either the end or the commencement of friendship. Such are most of the circumstances of a duel.

It is professed that this duel takes place for the purpose of *satisfaction.* The affronter professes to have satisfied the man whom he has affronted, and the challenger professes to have been satisfied by the man whom he has challenged, after they have fired, or have had an opportunity of firing pistols at one another. That this satisfaction, which the one professes to give and the other to receive, is of that sort which is also expressed by the word *reparation,* is of course out of the question. Satisfaction in this its most obvious sense, or reparation for an injury, cannot be effected by the injured man firing at his injurer, and (what is more) being fired at in return.

The satisfaction furnished by a duel is of a different sort, and of a sort which, were it distinctly comprehended, would at once show the absurdity of the practice. It is a satisfaction occasioned by the knowledge that, by standing fire, the challenger has shown his courage, so that the world cannot call him coward. Now it is evident that there would be no reason for dissatisfaction on this point, previous to the fighting of the duel, and therefore no reason for seeking satisfaction of this sort, were it not that the practice of duelling existed. Were men not in the habit of fighting duels, and therefore not expected to expose themselves to fire after having received an affront, there would be no ground for calling their courage into question, and therefore no necessity for satisfying themselves that the world thinks them courageous. The practice of duelling then itself causes the evil which it is called in to remedy, the injury for which it is required to administer satisfaction. Such being the case, we call the practice absurd. And any one who saw this would immediately see its absurdity. But the word *satisfaction* is conveniently ambiguous. When one speaks of it, or hears it spoken of, one thinks of that satisfaction which means reparation for an injury, and which is the satisfaction furnished by the duel; and it is fancied that the practice has some reason in it. Thus are men the dupes of words.

The real object then of the duel is, in most cases, to satisfy the person who provokes it, or who sends the challenge, that the world does not suspect him of a want of courage; and it will be useful to observe, in passing, that the duel furnishes this sort of satisfaction as well to the man who gave the affront, as to him who was affronted. Its object also, in certain cases, is doubtless to gratify the vengeance of man who has received an affront. But in all cases that object which is professed, or which is generally understood to be professed, of satisfaction in the sense of reparation for the affront, is no more than a pretence.

Though the practice of duelling, however, cannot and does not effect the good of repairing an injury, it may very possibly effect other sorts of good. It is a question then worthy of consideration, whether this practice is, on the whole, productive of good or of evil? If it be, on the whole, productive of evil, another question arises, how is it to be got rid of?

The advantage of the practice of duelling is generally said to consist in its tendency to increase courtesy and refinement of manners. So far as this tendency exists or is supposed to exist, the manner in which it operates, or is supposed to operate, is obvious. It is, or is supposed to be, a reason for a man to abstain from giving an affront, that he will be subjected in consequence to the fire of a pistol.

Now it is clear, in the first place, that all the affronts which are constituted reasons or grounds of duels by fashion, or the law of honour, or (which is the same thing) public opinion, are so constituted because they are judged by public opinion deserving of disapprobation. If then the practice of duelling did not exist, public opinion, which now constitutes these affronts grounds of a duel, as being deserving of disapprobation, would still condemn them, and, condemning them, provide men with a reason to abstain from them. Thus there would still exist a reason to abstain, in all cases in which the practice of duelling now provides a reason. But, in the second place, the practice of duelling itself depends on public opinion alone. A man fights because public opinion judges that he who, in certain cases, refuses to challenge or to accept a challenge is deserving of disapprobation; he fights from fear of public opinion. If he abstain from giving an affront on account of the existence of the practice of duelling, it is because the fear of public opinion would oblige him to fight; he abstains then from fear of public opinion. Now we have seen that there would be the fear of public opinion to deter him from the affronts which now lead to duels, if the practice of duelling did not exist. Thus the practice of duelling does not in any case provide a reason to abstain, which public opinion would not provide without its aid. As a means then of increasing courtesy and refinement of manners, the practice of duelling is unnecessary; and inasmuch as its tendency to polish manners is the only advantage which can, with any show of probability, be ascribed to it, there will be no good effects whatever to set against the evil effects which we now proceed to enumerate. There will be no difficulty in striking the balance between good and evil.

First, the practice of duelling is disadvantageous, inasmuch as it often diminishes the motives to abstain from an affront. We have seen that the existence of this practice leads public opinion to employ itself concerning the courage of the two persons, who (the one having affronted and the other having been affronted) are in a situation in which, according to custom or fashion, a duel takes place. Public opinion then is diverted by the practice of duelling from the affront to the extraneous consideration of the courage of the two parties. It censures the man who has given the affront only if he shrinks from a duel; and even goes so far as to censure the man who has received the affront for the same reason. Thus in a case where a man, reckless of exposing his life, is disposed to give affronts, he is certain that he can avert censure for an affront by being ready to fight a duel; and in a case where a bold or reckless man is disposed to affront one who is timid, or a man expert with the pistol one who is a bad shot, he can reckon on the man whom he affronts refusing to fight, and on censure being thus diverted from himself who has given an affront to him who has shown want of courage. It is well observed in a clever article in the Westminster Review:—'It is difficult to conceive how the character of a bully, in all its shades and degrees, would be an object of ambition to any one, in a country where the law is too strong to suffer actual assaults to be committed with impunity, where public opinion is powerful, and duelling not permitted; but where duelling is in full vigour, it is very easy to understand that the bully may not only enjoy the delight of vulgar applause, but the advantages of real power.' (vol. iv., p. 28.)

Secondly, the practice of duelling is disadvantageous, as increasing the amount of injury which one man can do to another by an affront. There is not only the injury to his feelings occasioned by the affront, but also the fear excited by the danger to which the existence of the practice of duelling subjects him, after receiving the affront.

Thirdly, the practice of duelling affords means for the gratification of vengeance; and thus tends to hurt the characters of individuals, by the encouragement both of that feeling, and of hypocrisy in those who, thirsting for vengeance, and daring not to own it, profess (in the common ambiguous phrase) to be seeking for satisfaction.

Fourthly (which is the most important consideration), there are the evils entailed by the deaths which the practice of duelling brings about,—evils entailed both on the persons dying, and on their surviving relatives and friends. It is an evil that a man should be cut off from life, 'unhouseled, disappointed, unaneled.' It is an evil, that he should be taken from relatives and friends to whom his life is, in different ways and degrees, a source of happiness; from the parents who have centered in him their hopes, and to whom, in their declining years, he might be a comfort, or from the wife and children who look to him for support.

Such are the evil effects of the practice of duelling; and there being no list of good effects to set against them, it follows immediately that the tendency of the practice is, on the whole, evil. There arises then the question, how is it to be got rid of?

A mild and judicious legislation, one which takes into account, and does not set itself violently against, public opinion, may do much. The punishment assigned to the crime of duelling should (in Mr. Bentham's phrase) be *popular*. It should be a punishment which does not tend to excite sympathy for the criminal, and thus defeat its own object; for where an opinion prevails that a punishment is too severe, or where (in other words) a punishment is unpopular, witnesses, jurors, judges are provided by the punishment itself with motives to shield the criminal. It is clear that the punishment of death, which the law of England now assigns, is not popular; and it is clear further that, in consequence of this, it is almost entirely nugatory. Public opinion, which favours duelling, sets itself against the punishment of death, and renders legislation vain.

Were a man who had killed his antagonist in a duel compelled by the law to support, or assist in supporting, some of his surviving relatives, this, so far as it would go, would be a punishment popular and efficacious. Public opinion would then infallibly be against the man who, having incurred the penalty, should endeavour to avoid it. And such a punishment as this would furthermore be superior to the punishment of death, as being susceptible of graduation, as furnishing reparation to a portion of those who have been most injured, and as preserving the offender, that he may have all those opportunities, which his natural life will afford him, of improving himself and of benefiting others.

A mild and judicious legislation would tend to guide and improve public opinion; whereas such a legislation as the present tends only to confirm it in its evil ways.

And as legislation may and should assist the formation of a right public opinion, so is it possible and desirable to operate independently on public opinion, either that the absence of good legislation may, as far as is possible, be compensated for, or that the good legislation, when present, may in turn be assisted. Now this operation on public opinion must be brought about by the endeavours of individuals. It is the duty of each man to oppose this practice to the utmost extent of his power, both by precept and example; or (changing the phrase) each man will effect the greatest amount of good for himself and for his fellow men by adopting this course. It is his duty to abstain from challenging when he has received an affront, and to refuse a challenge when he is considered to have given one, making public in both cases, so far as his situation allows, his reasons for the course which he takes, and thus producing an impression against the practice as widely as he can. In the second of these two cases he must either be able to defend, or he must apologize for, that which was considered an affront. If he can defend it, or show that the evil to the person insulted was overbalanced by the good accruing to others, he refuses rightly to be fired at for having been the author of a benefit; or, if unable to defend the affront, he apologizes for it, he performs a manly and a rational part in refusing to fire at a man whose feelings he has wantonly injured.

This duty is peculiarly incumbent on public men, whose sphere of influence is larger, and whose means of producing good effects by example are therefore greater, than those of others. A public man who should at all times refuse to challenge or to accept a challenge, resting his refusal on the ground of the evil tendency of duelling, not of the infraction of some other duty which an accident has in his case connected with it (as the violation of an oath), and who should at the same time preserve himself from suspicion or reproach by circumspection in speech, by a manly defence, where it is possible, and, where it is not, by a manly apology, would be a mighty aid for the extirpation of this practice.

We have said nothing as to the objections to duelling on religious grounds, it being never denied, so far as we are aware, that the practice is incompatible with the profession of Christianity.

DUET (*Duetto*, Ital. from *Duo*), a musical composition for either two voices or two instruments. According to the Padre Martini, the *duo* is a vocal composition in the severe ecclesiastical style, without any kind of accompaniment; the *duetto*, or diminutive of *duo*, one written more freely, in a lighter manner, and admitting accompaniment. The older word is now, however, become obsolete.

DUFRESNE. [CANGE, DU.]

DUGDALE, SIR WILLIAM, was the only son of John Dugdale, Esq., of Shustoke, in the county of Warwick, where he was born September 12th, 1605. His mother was Elizabeth, daughter of Arthur Swynfen, Esq., of Staffordshire. He was in part educated in the free-school at Coventry, and subsequently with his father, with whom he also read 'Littleton's Tenures,' some other law-books, and history. In 1622 he married Margery, the second daughter of John Huntbach, Esq., of Seawall, in Staffordshire. Upon his father's death in 1624, he succeeded to a small estate in Shustoke, to which he added by purchase the manor of Blythe, in that parish, in 1625. This latter estate is still in the possession of his descendants.

Dugdale's natural inclination, which was chiefly the study of antiquities, brought him acquainted with the most eminent antiquaries of his day. Sir Symon Archer, of Tamworth, introduced him to Sir Christopher Hatton and Sir Henry Spelman, by whose joint interest with the earl of Arundel, then Earl Marshal, he was created a pursuivant-at-arms extraordinary, by the name of Blanche Lyon, in September, 1638. Afterwards he was made Rouge Croix pursuivant in ordinary, by letters patent dated March 18th, 1639-40; by which means, having lodging in the Heralds' College, and convenient opportunities, he made large collections from the Records in the Tower of London, as well as from other places.

In 1641, by Sir Christopher Hatton's encouragement, he superintended the making of exact drafts of all the monuments in Westminster Abbey, St. Paul's Cathedral, and in many other cathedral and parochial churches of England; particularly those at Peterborough, Ely, Norwich, Lincoln, Newark-upon-Trent, Beverley, Southwark, Kingston-upon-Hull, York, Selby, Chester, Lichfield, Tamworth, Warwick, &c. The drawings were made by one William Sedgewick, an arms-painter, then a servant of Sir Christopher Hatton; the inscriptions were copied by Dugdale. Both were deposited in Sir Christopher Hatton's library, that the memory of these monuments might at least be preserved; the state of the times threatening imminent destruction to the originals.

In June, 1642, the king, who had retired to York, summoned Mr. Dugdale to attend upon him, according to the duty of his office. Dugdale accordingly repaired to York, and was afterwards commanded to attend the earl of Northampton, who was marching into Worcestershire to oppose the forces raised by lord Brooke for the service of the Parliament. He attended upon the king at the battle of Edgehill, and afterwards at Oxford, where he continued with his Majesty till the surrender of the garrison there to the Parliament, June 22nd, 1646. He was created M.A. November 1st, 1642; and April 16th, 1644, was promoted to the office of Chester-herald. During his long residence at Oxford, he applied himself to such researches in the Bodleian, and the different college libraries, as he thought might conduce toward the furtherance of the 'Monasticon,' then designed by Roger Dodsworth and himself: as well as the history of the antient nobility of the realm, and of which he afterwards made much use in his 'Baronage.'

After the surrender of Oxford upon Articles, Dugdale, having the benefit of them, and having compounded for his estate, went to London; where he and Dodsworth proceeded vigorously in completing their collections from the Tower Records and Cottonian library. A short absence from England in 1648, when he attended lord and lady Hatton to Paris, enabled him to improve his and Dodsworth's collections with notices and charters relating to the Alien Priories of England, from the papers of Andrew Du Chesne. When their collections were ready, the booksellers declining to venture upon so large and hazardous a work, Dodsworth and Dugdale printed the first volume at their own charge, which was published in 1655, in folio, under the tile of 'Monasticon Anglicanum,' adorned with the views of abbeys, churches, &c. The second volume was published in [illegible] in 1661. These two volumes were collected, and chiefly written by Dodsworth; but Dugdale took great pains in methodizing and disposing the materials, in making several indexes to them, and in correcting the press. Dodsworth died in August, 1654, before the tenth part of the first volume was printed off. A third volume was published in 1673.

From an entry in his diary, as early as 1658, Dugdale appears to have feared that a translation of the 'Monasticon' would have been published by Mr. King, probably Gregory King, at that time his clerk. That such a one was prepared, as far as the first volume was concerned, is evident, since Dugdale describes it as 'erroneously Englished in a multitude of places.' The translation, however, or rather the epitome, which was subsequently printed, did not appear till 1692, six years after Sir William Dugdale's death. The dedication to William Bromley, Esq., is signed J. W. It is ascribed to James Wright, who, in 16[illegible], published the 'History and Antiquities of the County of Rutland.' Another epitome, by an anonymous writer, was published in 1718: but believed to have been by Captain John Stevens, who, in 1722 and 1723, published two additional volumes to the 'Monasticon,' which, besides abundance of additional information in English, contained a very large collection of new charters, together with a History of the Friaries, to which no place had been assigned in the volumes published by Dugdale. The Rev. Samuel Peck, in 1735, promised a fourth volume of the 'Monasticon,' which was never completed. His collections for it are in the British Museum.

An improved edition of the 'Monasticon' was undertaken in 1812 by the Rev. Bulkeley Bandinel, D.D., keeper of the Bodleian library at Oxford, who soon relinquished the task to two other gentlemen who had been called coadjutors, John Caley, Esq., of the Augmentation Office, and Henry Ellis, Esq., keeper of the MSS. in the British Museum. An account of each religious house, in English, was prefixed to its respective series of Latin charters; many new materials from leiger-books, rolls, and other documents were added, including all that was valuable in Stevens's volumes, with the history of several hundred religious foundations which were unknown to Dugdale. The chief of the prints, by Hollar, which ornamented the original edition, were re-engraved, and above 200 plates of churches and monasteries added, from drawings made exclusively for the work. This new edition was completed in 18[illegible], in six volumes folio, the last volume divided into three parts.

In 1656 Dugdale published, at his own charge, 'The Antiquities of Warwickshire, illustrated from Records, Leiger-books, Manuscripts, Charters, Evidences, Tombes and Armes, beautified with Maps, Prospects, and Portraictures,' folio, Lond.: this is one of the very best of our county histories. A second edition was published, in two volumes folio, in 1730, revised and augmented by William Thomas, D.D.; and a third was contemplated a few years ago, and large preparations made for it, by the late William Hamper, Esq., of Birmingham. While this work was printing, Dugdale remained in London, during which time he had opportunity of collecting materials for another work, which he published in 1658, 'The History of St. Paul's Cathedral in London,' folio. A second edition of this work, enlarged, was published in 1716, in folio, by Edward Maynard, D.D., rector of Boddington in Northamptonshire; and a third in 1818, by Henry Ellis, Esq. The plates of the original editions, both of the Warwickshire and the St. Paul's, were by Hollar. To the two last editions of the St. Paul's a life of Dugdale was prefixed.

Upon the restoration of King Charles II., through Lord

Chancellor Hyde's recommendation, Dugdale was advanced to the office of Norroy King of Arms. In 1662 he published 'The History of Imbanking and Drayning of divers Fenns and Marshes, both in Foreign Parts and in this Kingdom, and of the Improvements thereby,' fol. Lond. 1662: a second edition of which, revised and corrected by Chas. Nalson Cole, Esq., appeared in fol. Lond. 1772. This work was written at the desire of the Lord Gorges, Sir John Marsham, and others, who were adventurers in draining the great level which extends itself into a considerable part of the counties of Cambridge, Huntingdon, Northampton, Norfolk, and Suffolk. [Bedford Level.] About the same time Dugdale completed the second volume of Sir Henry Spelman's 'Councils,' which was published in 1664 under the title of 'Concilia, Decreta, Leges, Constitutiones in Re Ecclesiarum Orbis Britannici, &c., ab Introitu Normannorum, A.D. 1066, ad Exutum Papam, A.D. 1531. Accesserunt etiam alia ad Rem Ecclesiasticam spectantia,' fol. Archbishop Sheldon and Lord Clarendon, who were the great encouragers of this labour, likewise employed Dugdale to publish the second part of Sir Henry Spelman's 'Glossary.' Having revised the first part, which had been published in 1626, and arranged the materials of the second, both were printed together in 1664 under the title of 'Glossarium Archaiologicum, continens Latino-barbara, Peregrina, Obsoleta, et Novæ Significationis Vocabula.' The second part, digested by Dugdale, began with the letter M. There was another edition of this work in 1687.

In 1666 he published, in folio, 'Origines Juridiciales; or, Historical Memoirs of the English Laws, Courts of Justice, Forms of Trial, Punishment in Cases Criminal, Law Writers,' &c. &c., with portraits of several of the judges, and some other plates. A second edition was published in 1671, and a third in 1680. The first volume of 'The Baronage of England' appeared in 1675, and the second and third in 1676, folio. Upon this work he had spent thirty years of labour; and though the corrections to be made in it are numerous, it still remains one of the best works which exist as a foundation of English history. [Baronage.]

In May, 1677, Dugdale was created Garter King of Arms, and the day after received from his Majesty the honour of knighthood, much against his will, on account of the smallness of his estate. In 1681 he published 'A short View of the late Troubles in England, briefly setting forth their Rise, Growth, and Tragical Conclusion,' folio. This is the least valued of his publications. He published also, at the same time, 'The Antient Usage in bearing of such Ensigns of Honour as are commonly called Arms,' &c., 8vo., a second edition of which, with large additions, was published in the beginning of the year following; and a third edition, edited by T. C. Banks, Esq., folio, London, 1811.

The last work which Dugdale published was 'A perfect Copy of all Summons of the Nobility to the Great Councils and Parliaments of this Realm, from the 49th of king Henry III. until these present times,' folio, London, 1685. A facsimile, with the original date of this work, was printed at Birmingham between forty and fifty years ago.

This industrious man died at Blythe Hall, February 10th, 1686, in his eighty-first year, in consequence of a cold; and was interred at Shustoke. His epitaph in Latin, written by himself, is inscribed upon a tablet near the spot of his interment.

An account of Dugdale's manuscript collections remaining in the Ashmolean Museum at Oxford, and in the possession of his descendant, the late Dugdale Stratford Dugdale, Esq., at Merevale in Warwickshire, will be found appended to his *Life, Diary, and Correspondence*, edited by William Hamper, Esq., 4to., London, 1827, whence the principal particulars of the present life have been obtained. (See also the life prefixed to the last edition of the *History of St. Paul's*; and Chalmers's *Biogr. Dict.*, vol. xii., pp. 420-427.)

DUGONG. [Whales.]

DUIKERBOK. [Antelope, vol. ii., p. 81, species 30.]

DUISBURG, a circle in the northern part of the great administrative circle of Düsseldorf in Rhenish Prussia, about 252 square miles in area, and containing 8 towns, 1 market-town, 14 villages, and 3 hamlets, with a population of about 76,500 inhabitants: an increase of 17,150 since 1817. The Rhine is the western and the Lippe the northern boundary. It possesses rich coal-mines, and has 108,850 acres of fine arable land, and 27,720 of meadows and pastures: grain, tobacco, rapeseed, flax, hemp, hops, linseed, &c. are raised.

DUISBURG, the chief town, lies on the Ruhr and Angerbach, not far from the right bank of the Rhine, which once washed its walls; in 51° 26′ N. lat., and 6° 46′ E. long. It is said to have received its name from the Tuisconi or Teutones, who had a camp on this spot: in the time of the Romans it was denominated the Castrum Deusonis. The town is surrounded by walls and decayed towers on one side, and by a rampart and ditches on the other, and is situated in a fertile and agreeable country. The number of houses is about 700, and of inhabitants about 5500: in 1784 the number of the one was 682, and of the other 3531: the population has therefore increased about 1969 during the last fifty-two years, or upwards of one per cent. yearly on the average. Duisburg contains a gymnasium founded in 1599, an orphan asylum and hospital, endowed almshouses, a monastery of Minorites, and five churches, of which that of John the Baptist dates from the year 1187, and that of St. Salvator, on the tower of which once stood an observatory, from 1415; two of them are Roman Catholic, and the others Protestant. It was the site of a Protestant university, founded in 1655 and abolished in 1802. There are considerable manufactures in the town, particularly of woollen-cloth, cottons, stockings, hats, woollen coverlids, velvet, soap, starch, and leather; and an extensive traffic with the Westphalian provinces in wine and colonial produce, grain, and cattle. In the neighbourhood there are two iron-works, where large quantities of cast-iron are made. The Duisburg forest, mentioned by Tacitus (*Annal.* i. 60), under the name of the Saltus Teutoburgensis, is in the vicinity.

DUKE. The title given to those who are in the highest rank of nobility in England. The order is not older in England than the reign of king Edward III. Previously to that reign those whom we now call the nobility consisted of the barons, a few of whom were earls. Neither baron nor earl was in those days, as now, merely a title of honour; the barons were the great tenants in chief, the earls important officers in the community. It does not appear that in England there was ever any office or particular trust united with the other titles of nobility, viscount, marquis, and duke. They seem to have been from the beginning merely honorary distinctions. They were introduced into England in imitation of our neighbours on the continent. Abroad however the titles of duke and marquis had been used to designate persons who held no small political power, and even independent sovereignty. The czar was duke of Russia or Muscovy. There were the dukes of Saxony, Burgundy, and Aquitaine: persons with whom the earls of this country would have ranked, had they been able to maintain as much independence on the sovereign as did the dukes on the continent of the Germanic or the Gallic confederacy. An important officer during the lower empire had the title of dux, which is probably the origin of the modern duke or doge in every country of Europe. [Doge.]

The first person created a duke in England was Edward Prince of Wales, commonly called the Black Prince. He was created duke of Cornwall in parliament, in 1335, the eleventh year of king Edward III. In 1350, Henry, the king's cousin, was created duke of Lancaster, and when he died in 1361, his daughter and heir having married John of Gaunt, the king's son, he was created duke of Lancaster, his elder brother Lionel being made at the same time duke of Clarence. The two younger sons of king Edward III. were not admitted to this high dignity in the reign of their father: but in the reign of Richard II., their nephew Edmund was made duke of York, and Thomas duke of Gloucester.

The dignity was thus at the beginning kept within the circle of those who were by blood very nearly allied to the king, and we know not whether the creation of the great favourite of king Richard II., Robert Vere earl of Oxford, duke of Ireland, and marquis of Dublin, is to be regarded as an exception. Whether, properly speaking, an English dignity or an Irish, it had but a short endurance, the earl being so created in 1385 and attainted in 1388.

The persons who were next admitted to this high dignity were of the families of Holland and Mowbray. The former of these was half-brother to king Richard II.; and the latter was the heir of Margaret, the daughter and heir of Thomas de Brotherton, a younger son of king Edward I., which Margaret was created duchess of Norfolk in 1358. This was the beginning of the dignity of duke of Norfolk, which is still existing, though there have been several for feitures and temporary extinctions. Next to them, not to mention sons or brothers of the reigning sovereign, the title was conferred on one of the Beauforts, an illegitimate son of John of Gaunt, who was created by king Henry V. duke of Exeter. John Beaufort, another of this family, was made duke of Somerset by king Henry VI.

In the reign of Henry VI. the title was granted more widely. There were at one time ten duchesses in his court. The families to whom the dignity was granted in this reign were the Staffords, Beauchamps, and De la Poles. In 1470, under the reign of Edward IV., George Nevil was made duke of Bedford, but he was soon deprived of the title, and Jasper Tudor was made duke of Bedford by his nephew king Henry VII. in the year of his accession.

King Henry VIII. created only two dukes, and both were persons nearly connected with himself; one being his own illegitimate son, whom he made duke of Richmond, and the other Charles Brandon, who had married the French queen, his sister, and who was made by him duke of Suffolk. King Edward VI. created three: viz., his uncle, Edward Seymour, the Protector, duke of Somerset (from whom the present duke of Somerset derives his descent, and, by reversal of an attainder, his dignity), Henry Grey, duke of Suffolk, and John Dudley, duke of Northumberland. The struggles of these three great peers proved the ruin of all and the extinction of their dignities.

Queen Elizabeth found on her accession only one duke, Thomas Howard, duke of Norfolk, attainder or failure of male issue having extinguished the others. He was an ambitious nobleman, and aspiring to marry the queen of Scotland, Elizabeth became jealous of him: he was convicted of treason, beheaded, and his dignity extinguished in 1572; and from that time there was no duke in the English peerage except the sons of king James I., till 1623, when Ludovick Stuart, the king's near relative, was made duke of Richmond, which honour soon expired. In 1627 George Villiers was created duke of Buckingham, and he and his son were the only dukes in England till the civil wars, when another of the Stuarts was made duke of Richmond, and the king's nephew, best known by the name of prince Rupert, duke of Cumberland.

We see how choice this dignity was regarded down to the reign of king Charles II. In the first year after his return from exile, that prince restored the Seymours to their rank of dukes of Somerset, and created Monk, the great instrument of his return, duke of Albemarle. In 1663 he began to introduce his illegitimate issue into the peerage under the title of duke, his son James being made in that year duke of Monmouth. In 1664 he restored to the Howards the title of duke of Norfolk, and in 1665 created a Cavendish, who had held a high military command in the civil war, duke of Newcastle. In 1682 he created the marquis of Worcester duke of Beaufort. As for the rest the dignity was granted only to issue of the king or to their mothers. The only duke created by king James II. was the duke of Berwick, his natural son.

Of the families now existing, beside those who descend of king Charles II., only the Howards, the Seymours, and the Somersets date their dukedoms from before the Revolution. The existing dukedoms originally given by Charles II. to his sons are Grafton, Richmond, and St. Albans. Under king William and queen Anne several families which had previously enjoyed the title of earls were advanced to dukedoms, as Paulet duke of Bolton, Talbot duke of Shrewsbury, Osborne duke of Leeds, Russell duke of Bedford, Cavendish duke of Devonshire, Holles duke of Newcastle, Churchill duke of Marlborough, Sheffield duke of Buckinghamshire, Manners duke of Rutland, Montagu duke of Montagu, Douglas duke of Dover, Gray duke of Kent, Hamilton duke of Brandon; besides members of the royal family and Marshal Schomberg, who was made an English peer as duke of Schomberg. This great accession gave an entirely new character to the dignity. King George I. followed in the same policy, giving us, besides the dukedoms in his own family, Bertie duke of Ancaster, Pierrepoint duke of Kingston, Pelham duke of Newcastle, Bentinck duke of Portland, Wharton duke of Wharton, Brydges duke of Chandos, Campbell duke of Greenwich, Montagu duke of Manchester, Sackville duke of Dorset, and Egerton duke of Bridgewater. George II. adopted a different policy: he created no duke out of his own family, and the only addition he can be said to have made to this branch of the peerage was by enlarging the limitation of the Pelham dukedom of Newcastle so as to comprehend the Clintons, by whom the dukedom is now possessed. From 1720 to 1766 there was no creation of an English duke except in the royal house. In that year the representative of the antient house of Percy was made duke of Northumberland, and the title of duke of Montagu, which had become extinct, was revived in the Brudenells, the heirs. The same forbearance to confer this dignity existed during the remainder of the reign, and during the reign of George IV., no dukedom being created out of the royal house, till the eminent services of the duke of Wellington marked him out as deserving the honour of the highest rank which the king has it in his power to confer. His dukedom was created in 1814, forty-seven years after the creation of a duke of Northumberland. The marquis of Buckingham was advanced to the rank of duke of Buckingham and Chandos in 1822, so that for a hundred years, namely from 1720 to 1822 only four families were admitted to this honour.

During the reign of William IV. two dukedoms have been created, Gower duke of Sutherland, and Vane duke of Cleveland.

The whole number of dukes in the English peerage is at present twenty-one, exclusive of the blood royal. There are seven Scottish dukes, two of whom are also English dukes. The only Irish duke is the duke of Leinster.

All the dukes of England have been created by letters patent in which the course of succession has been plainly pointed out. Generally the limitation is to the male heirs of the body.

DUKER, CHARLES ANDREW, a distinguished scholar, born at Unna in La Marck, in the year 1670. He studied first at Hammon, and afterwards, under *Perizonius*, at Franeker. About the year 1700 he became professor of history and eloquence at Herborn, in Nassau, which he exchanged, four or five years afterwards, for the place of under-master in the school at the Hague. On the death of Perizonius, in 1716, the Greek chair in the university of Leyden became vacant, and was offered to Burmann, who accepted it, and thereby vacated the professorship of history and eloquence which he held at Utrecht, and which was divided between Duker and Drakenborch, Burmann's pupil and friend. In 1734 Duker gave up his professorship and retired to the country. He died at Meyderic on the 5th of November, 1752. Duker is best known by his edition of Thucydides, published at Amsterdam 1731 (fol.), which was, till Bekker's appeared in 1821, by far the best edition of that author. The great care and labour which he bestowed upon this work made Schröder call him *[illegible] Thucydideus (Præf. ad Senec. Tragædias)*. Duker also edited Florus in 1722, and contributed to the edition of Livy published by his colleague Drakenborch, to the 'Origines Babylonicæ et Ægyptiacæ' of his friend Perizonius, and to other works. All his notes are sensible and accurate; but it has been remarked that in his Thucydides in particular he has been rather capricious in choosing passages for illustration, and has omitted explanations in the very places where they were most necessary.

DULCIMER, a very antient musical instrument, and not yet entirely fallen into disuse. There seems to be little doubt of this being the psaltery, psalterium, or nebel, of the Hebrews. In shape it was sometimes a triangle, sometimes a trapezium, as appears from Luscinius, Kircher, and Blanchinus, a fact overlooked by Sir John Hawkins, who argues, in opposition to Kircher, that the instrument took different names according to its different forms. The dulcimer, as now used by street-musicians, to whom it is confined, is a trapezium in shape, has many strings, two to each note, and is struck by a pair of sticks with wooden or metallic knobs. The tone much resembles that of the old spinnet, and in skilful hands the instrument is of rather an agreeable kind. [CITOLE.]

DULVERTON. [SOMERSETSHIRE.]

DULWICH. [ALLEN; BOURGEOIS.]

DUMBARTON, or DUNBARTON, the chief town of Dumbartonshire, in Scotland, is an antient royal burgh, and was in very early times the head town of the earldom of Lennox. It is situated at the confluence of the Leven with the Clyde, about 14 miles west-north-west from Glasgow and 52 west from Edinburgh.

The first charter granted to Dumbarton was that of Alexander II., in the beginning of the thirteenth century; this charter, as well as those of several succeeding monarchs, was confirmed by James VI. in 1609, and ratified by Parliament in 1612. The revenue of the burgh is about 1,030*l* per annum, but the expenditure generally exceeds that sum. Two burgh courts are held weekly. Dumbarton is in schedule (E) of the Scotch Reform Act (2 & 3 Will. IV. c. 65), and returns one member to Parliament, jointly with Renfrew, Rutherglen, Kilmarnock, and Port-Glasgow. The population in 1831 was 3623. There is a school, under the patronage of the magistrates, superintended by two teachers.

The castle stands on a steep rock, rising up in two points, and inaccessible on every side, except by a very narrow passage, fortified with a strong wall or rampart. Within this wall is the guard-house, with lodgings for the officers, and from hence a long flight of stone steps leads to the upper part of the castle, where there are several batteries mounted with cannon, the wall being continued almost round the rock. There are the remains of a high gateway and wall, the top of which has a bridge of communication from one summit of the rock to the other. There is also an excellent well constantly supplied with water. The rock on which the castle stands is nearly surrounded with water, and forms a highly interesting view from the Clyde, whose waters wash its base. Considered as the key to the Western Islands, this castle was always a great object of contention, and has sustained many memorable sieges. It is now garrisoned by some invalids, under the command of a governor and some subaltern officers. In the upper part, where the rock divides, convenient barracks have been erected, as well as a small arsenal, containing Wallace's gigantic sword and many other curiosities.

DUMBARTONSHIRE, a small maritime county in the west of Scotland, between 55° 53′ and 56° 20′ N. lat., and 3° 50′ and 4° 50′ of W. long. It consists of two separate parts, having an intervening distance of six miles between their nearest approaching points. The larger and western part is bounded on the west by Loch Long, by which it is separated from the county of Argyle; the southern boundary is formed by the river Clyde, the eastern by the county of Stirling, and the northern by Perthshire. The antient name of the county was Levenach, that is, county of the Leven, which subsequently became Levenax, and finally Lennox. It is about 36 miles in length from north-west to south-east, in a straight line, and in the middle about 15 miles in breadth from east to west. Loch Lomond is not wholly included within the county. The small detached eastern part is half enclosed by Stirlingshire on the north, and by Lanarkshire on the south, and measures 12 miles from east to west, and about 4 miles from north to south. The whole area of the county is 165,760 acres, or 259 square miles, of which 19,840 acres are water. In the western part the parishes are ten in number, namely, Dumbarton, Cardross, Roseneath, which is a peninsula formed by Loch Long and Gare Loch, Row, Arroquhar, Luss, Bonhill, Kilmaronoch, and West and East Kilpatrick. The eastern part is composed of two parishes, Kirkintilloch, and Cumbernauld. Two-thirds of the surface consist of mountains, partially presenting woods, mosses, and moors, and incapable of cultivation. The most remarkable are Ben Voirlich, Arrochar, Benequirach, Luss, Row, and Roseneath; the rugged and precipitous summits of which are frequently covered with snow and clouds. Ben Voirlich, in the northern extremity of the county, and near the northern extremity of Loch Lomond, is 3330 feet above the level of the sea, that is, above 100 feet higher than the adjacent Ben Lomond. There are many highly picturesque situations in this county. The contrast of sterile mountains and verdant glens is very striking. Loch Lomond, which covers about 20,000 acres, presents the richest description of lake and highland scenery. Its length is 22 miles; its surface is studded with many beautiful little islands, and its finely wooded shores are adorned with elegant villas. The climate is in general mild and very moist. Yet the lateness of the spring, the frequency of showers and cloudy weather during harvest, with blighting mountain winds in the spring and autumn, and the early commencement of winter, are insuperable disadvantages to agriculture; but for pasturage, and especially for the growth of timber, the climate is remarkably well adapted; nor is it unfavourable to health and longevity. The natural copse woods and plantations cover several thousand acres, and consist of oak, ash, yew, holly, mountain-ash, birch, hazel, aspen, alder, crab, thorn, and willow. The comparative extent of arable land is very small; it is chiefly clay, and lies mostly on the south of Loch Lomond, and along the Clyde. The prevalent soils are clay, gravel, black loam, and a small portion of bog. Potatoes, oats, and wheat are the principal crops. The cattle are chiefly of the West Highland breed. From 12,000 to 17,000 are annually sold at the market on Carman Moor. Cows of the Ayrshire breed have been introduced into most of the dairy farms. The sheep are of the small black-faced mountain breeds. In 1811, at the time of the agricultural survey, the number was 28,000, but the general improvements in farming which have since been made in the county have greatly increased all kinds of stock and produce. Property is in few hands, and farms are of very various extent, but chiefly small. The principal mineral production is coal, of which there is a large field, but of inferior quality. About 11,000 tons are dug annually at Langfauld, in the southern extremity of the county (West division). Pyrites is procured in small quantities at the same place. In the Eastern division of the county about 3000 tons of ironstone are dug and conveyed on the Clyde and Forth canal to the great iron-foundry at Carron. Some large quarries of limestone are worked, and of white and red freestone. There are several slate quarries yielding annually about 80,000 slates, of which the greater portion is taken to Glasgow, along the rivers Leven and Clyde, and the Glasgow canal.

On the banks of the Leven are numerous and very extensive works for cotton-printing, and bleaching-fields; the pureness of the Leven water being peculiarly adapted for this process. This stream, which, with the exception of numerous mountain torrents, is the only one worthy of notice, runs rapidly a distance of about five miles from Loch Lomond to the Clyde at Dumbarton Castle, and is navigable for lighters. The value of salmon annually taken in the Clyde and Leven, and sent chiefly to Glasgow, is stated at 1000*l*. Fifty boats are employed in the herring fishery, which produces annually about 4500*l*. Some large iron works are established at Dalnotter; there are also extensive and prosperous manufactories of glass and paper. Dumbarton is the chief town, and the principal road is from thence to Glasgow. The valued rental of the county is 33,328*l*. Scotch. The population in 1831 was 33,211. The county sends one representative to parliament. (*Agricultural Survey*, by Whyte and Macfarlan, 1811; Mac Culloch's *Statistics of the British Empire*, 1837, &c.)

DUMBNESS. [DEAF AND DUMB.]

DUMFRIES, the capital of the county of Dumfries, and the seat of a presbytery and synod, is beautifully situated upon a rising ground on the east side of the river Nith, about nine miles from its influx into the Solway Frith. The river is navigable for ten or twelve miles, and vessels of 120 tons' burden can approach the town. Two bridges cross the river; one on a very antient structure, supposed to have been begun by Devorgilla Douglas, mother of John Baliol, king of Scotland; the other was built in 1795. The town is 34 miles from Carlisle, 79 from Glasgow, and 71 from Edinburgh. The principal street is about three quarters of a mile in length, and, on an average, about 60 feet in breadth. Many of the other streets communicate with it at right angles. The public buildings and houses are chiefly of red freestone, and have a handsome appearance. The streets and shops are well lighted by gas. There are two parish churches, and eight chapels for dissenters. The ministers of the two churches have each a stipend of about 300*l*. a year. The stipends of the dissenting ministers amount to from about 100*l*. to 150*l*. each: 1000 families attend the two established churches, and about 700 the dissenting places of worship. Neither the churches nor chapels have any free sittings. A third church is about to be erected. St. Michael's church-yard contains a great number of interesting monuments; among which is an elegant mausoleum, erected by subscription to the memory of the poet Burns, whose remains are deposited in a vault beneath. A handsome piece of marble sculpture, executed by Turnerelli, representing the genius of Scotland finding the poet at the plough, and throwing her inspiring mantle over him, adorns the monument.

In the middle of High Street is Mid Steeple, where the meetings of the town-council are held; and opposite to it is the Trades' Hall, for the meeting of the seven incorporated [illegible] great antiquity. There is no [illegible] record of an earlier date than the beginning of the [illegible] century, when a monastery was erected for [illegible] In this monastery the Comyns were [illegible] Bruce, aided by Roger K[illegible] and James [illegible] For the convenience of this [illegible] a bridge of thirteen arches was erected across the [illegible] of these only [illegible] now remain. A strong castle is said to have been founded here in the twelfth century, of which there is now not a vestige. Like most other towns, it was entered and guarded by four ports, independent of inferior gates. Some of these were constructed in the form of a portcullis, surmounted with a tower. Dumfries was twice burnt by the English; once in the middle of the thirteenth century, and again in 1536. Queen Mary and her privy council came here to ratify a peace with England in 1563. About two years afterwards, some disaffected [illegible] raised a force, against which Mary advanced an [illegible] 18,000 men. These nobles fled to England, and [illegible] soon surrendered. [illegible] the town was taken and ransacked by the English

[illegible] James VI., [illegible]

[illegible] the west by [illegible] lesser diameter, [illegible] miles. [illegible] about 17[illegible] square miles. [illegible] county was formerly [illegible] Annandale, Eskdale, and Nithsdale [illegible] portion of territory which [illegible] three rivers after which they [illegible] east, Nith on the west, and Annan [illegible] In [illegible] the population was [illegible] emigrate to America [illegible]

[illegible] *mountains.*—The sur[illegible] About half of [illegible] the sea-coast, and one-third [illegible] ranges, and vales. [illegible] in the county, is [illegible] near Leadhills, [illegible] Ettrick Pen [illegible] Hill, 2140; Cairn K[illegible] Wisp Hill, in Ewes, [illegible] Langholm H[illegible]

[illegible] are nine lakes or [illegible] size. The antient [illegible] from a very narrow pen[illegible] castle-loch, which is [illegible] Some years ago a canal was [illegible] the Solway Frith, which [illegible] with incalculable advant[illegible] Annandale. It is asserted that [illegible] for the table are found [illegible] the Vendace, a very de[illegible] some resemblance to [illegible] peculiar to the large lake. The mounta[illegible] Skeen, situated near the head of M[illegible] Water, is [illegible] ft. above the level of the sea, and [illegible] miles in circumference. This lake feeds the well-[illegible] the Grey Mare's Tail, and is well [illegible] with delicate trout of a large size. There are several lochs or lakes of less extent.

The principal rivers in the county are the Nith, A[illegible] and Esk. The Nith enters the county from Ayrshire, [illegible] runs in a south-east direction, in a very winding [illegible] above 40 miles, passing Sanquhar, Thornhill, and D[illegible] About nine miles below the last-mentioned place [illegible] into the Solway Frith. The surrounding mountain ridges approach near each other above Drumlanrig and also near Blackwood, and divide the vale of [illegible] into three portions, which have been named the vale [illegible]quhar, the vale of Closeburn, and the vale of D[illegible] The tributary streams that join the Nith are the [illegible] Scarr, Shinnel, Cample, Carron, Menorh, Euch[illegible] wick, and Killoe. Its banks are almost everywhere [illegible]tified with gentlemen's seats and pleasure-grounds.

The Annan takes its rise near the sources of [illegible] and Tweed, among the mountains near the junc[illegible]

Lanarkshire and Peebleshire with this county, and runs a course nearly south of about 30 miles, in which it passes Moffat, Lochmaben, and Hoddam. It enters the Solway a mile below the royal burgh of Annan, the second town in the county. The tributary streams that flow into the Annan are the Mein, Wamphray, Evan, Milk, Dryfe, Kinnel, Ae, and Moffat. A beautiful ridge crosses the vale of this river from Kirkwood by Murraythwaite to Mount Annan. In the bed of the Kinnel is a rock called Wallace's Leap, near which place Wallace concealed himself after the battle of Falkirk. In the other tributary streams are several cascades, well known for the grandeur of the scenery which surround them.

The Esk rises in the mountains on the borders of Selkirkshire, runs in a southerly direction above 20 miles in the county, passes Langholm and Canobie, and forms near the latter place for one mile the boundary with England; after which it enters Cumberland, and turns westward through an open country by Longtown into the Solway Frith. This river receives in its course the Liddel, Tarras, Wauchope, Ewes, Meggat, and Black Esk. In the vale of Esk is some romantic and picturesque scenery, especially between Langholm and Longtown, where there is one of the most beautiful carriage-drives in the kingdom. The Kirtle is a romantic little river that enters the Solway Frith a little distance from the Sark, which is a border stream, and forms the boundary between England and Scotland for some distance before it enters the Solway. Both these rivers rise from the hills in the neighbourhood of Langholm, and pursue a southern course of about 20 miles.

The Lochar is a mere rivulet, which rises in Tinwald parish, near a small village called *Jericho*, runs about 12 miles in a very serpentine course, and discharges itself direct into the Solway, a few miles east of the mouth of the Nith.

The larger rivers contain salmon, herlings, parr or samlet, and sea-trout. These, and also flounders and cod, and occasionally turbot, soles, and herrings, are taken in the Solway Frith. Along the shore considerable quantities of cockles and mussels are gathered by the poor people. The smaller rivers contain pike, perch, trout, and eels. Fishing for salmon, grilse, and sea-trout, whiting or herling, commences in the Annan and Nith on the 10th of March, and closes on the 15th of September, both of which times are generally considered a month too early. The fisheries of all the rivers of Dumfriesshire are much injured by stake-nets in the Solway, and by salmon being killed in the spawning season.

Game-birds of various kinds are very plentiful, particularly pheasants, black game, grouse, and partridges. The woodcock, curlew, plover, lapwing, and snipe are also abundant. Moor-fowl and ptarmigan shooting commences August 12th; heath-fowl August 20th; both terminate December 10th. Partridge-shooting commences September 1st, and that of pheasants October 1st; both end February 1st. Hares are numerous in many places, nor is the fox a stranger in the county; but neither the red deer nor the capercailzie, both of which were met with at one time in Dumfriesshire, are now in existence. In some of the mosses are found the remains of the *roe*, or forest-deer, which formerly abounded in the county; but none had been seen for many years until lately, when two or three were discovered at Raehills, and having been protected, they are now established in considerable numbers. They are supposed to have strayed from the hills of Lanarkshire.

Roads.—There are no public railroads or canals; but the county is intersected in almost every direction with turnpike and other roads. The Carlisle and Glasgow turnpike enters the county at Sark Bridge, passes through Gretna, Dornock, Annan, Dumfries, Thornhill, and Sanquhar. Another turnpike to Glasgow passes through Gretna, Ecclefechan, Lockerby, Dinwoodie Green, and Beattock Bridge. A general road leads from Carlisle towards Portpatrick by Annan and Castle Douglas. A turnpike-road extends from the town of Dumfries to Edinburgh by Moffat. The roads in general have of late been much improved, and are kept in excellent order. Safe and easy communications have been opened through several parts of the mountainous districts. A continuation of the projected railway from Manchester to Lancaster through Cumberland and Dumfriesshire to Glasgow would be an immense advantage and accommodation to the populous and manufacturing towns as well as to the agricultural districts on the line.

Geological Character.—The southern and lower part of the county consists of reddish-coloured sandstone, which becomes of a lighter colour and harder quality towards the north. This may be considered a continuation of the red marl formation of Cumberland. Proceeding farther northward, a reddish-coloured limestone, succeeded by a coarse white sandstone and blue limestone appears, and after these sandstone-rock and primitive mountains containing metallic ores. Limestone is worked in each of the three dales of the county, particularly at Kelhead in Annandale, and Closeburn in Nithsdale. A very remarkable appearance, and one that has excited considerable interest and speculation among geologists, was observed in a sandstone quarry in the parish of Lochmaben: distinct foot-marks of animals of various sizes were discovered, some of them 45 feet below the surface. The coal-field in the west of Cumberland is supposed to stretch through the Solway Frith towards the shores of Galloway and Dumfries, and to be buried at a great depth under the red strata of the shores and valleys of Nithsdale and Annandale. The coal-metals appear cropped out near Ecclefechan, Kirtle-town, and Canobie. Several unsuccessful trials by boring have been made in the low country, but never to a satisfactory depth, and coals are wrought only at the two extremities of the county, Sanquhar and Canobie. The former has probably no connexion with the coals of Cumberland, but is a part of the Ayrshire coal. A great portion of the county is supplied with coal from Cumberland, and from Lanarkshire and Ayrshire. The old red sand-stone appears in the bed of the Annan, near Jardine-hall.

At Wanlockhead, near Leadhills, are extensive lead-mines. During the last fifty years, 47,420 tons of lead have been raised. From this lead silver is extracted in the proportion of six to twelve ounces in the ton. Some pieces of lead ore have been met with in the parishes of Langholm, Johnstone, Penpont, and St. Mungo, but no mines are wrought there. Gold is occasionally found in the mountains at Wanlockhead, in veins of quartz, or washed down into the sand of the rivulets. In the reign of queen Elizabeth, 300 men were employed by Sir Bevis Bulmer, for several summers, and collected gold to the value of 100,000*l.* Within the last four years two pieces have been found which weighed respectively ninety and sixty grains. The largest piece ever found there is in the British Museum, and weighs four or five ounces. An antimony mine, discovered at Glendinning in 1760, was regularly wrought in 1793. The ore was a sulphuret, which yielded about 50 per cent. The vein seldom exceeded twenty inches in thickness, and contained blende, calcareous spar, and quartz. Copper ore and manganese have been met with in small quantities; the former in the parish of Middlebie. Ironstone exists in some places in spheroidal masses, and in beds and bogs, but no iron is worked from ores in the county. Gypsum occurs in thin veins. The rocks of many of the hills consist of greenstone and of greywacke, and greywacke slate. Floetz-trap is found on the summit of some of the mountains, and generally in the shape of mountain caps. Boulders of granite and sienite are found in various places, the latter most frequently in the low part of the county. There are several basaltic or whinstone rocks, the finest of which are met with in the mountains in the vicinity of Moffat. About a mile from the last mentioned place is a celebrated mineral water similar to the sulphureous water of Harrowgate, and about five miles distant, in a deep ravine on the side of Hartfell, is a chalybeate spring. There are also mineral waters in the neighbourhood of Langholm, Annan, and Lochmaben, and in some other parts of the county.

Climate.—That part of the county which adjoins the Solway Frith is low and warm. The mountainous district is cold and bleak, but seldom remains long covered with snow. The whole is supposed to be moist, and in general mild and salubrious. In summer and autumn the prevailing winds are from the west and south, and in the winter and spring from the east and north. In winter the cold is sometimes moderate, at other times severe. The spring is generally late. In summer the thermometer often stands above 76° of Fahrenheit, and has been observed as high as 92° in the shade. About 53° is considered the average annual temperature. The most dreadful snow storm on record occurred in 1794, on the 25th January; upwards of 4000 sheep, besides a number of black cattle, were destroyed by it. As much of the land is wet and destitute of shelter, the climate would be greatly improved by draining and planting. Wood is much wanted in the county, particularly on the higher ridges, both for use and ornament; and draining would be a most important improvement. At a moderate expense not only Lochar moss, but several other extensive tracts of wet and mossy ground might be drained and converted into valuable meadows and corn-fields. There are a few belts and clumps of trees, and young plantations which are thriving well, but their extent is very limited.

Agriculture.—The soil in the lower parts of the county is generally light and sandy. Along the margins of the great rivers are considerable tracts of rich alluvial soil. Between Tinwald and Torthorwald, and from the Hook to Lockerby are fine fields of loam; peat-moss prevails on many of the hills, and in some of the vales: the most extensive moss is that of Lochar, near Dumfries, which is eleven or twelve miles long, and between two and three broad. Clay is found extensively as a sub-soil, and in a few places as a soil mixed with other substances. In Annandale and Nithsdale the dry soil prevails. On many of the hills the soil is naturally wet. Many of the estates are freehold, and are held immediately of the crown. A considerable number are held of a subject superior. Lands of both tenures may be laid under entail for an unlimited period, and in favour of heirs yet unborn. As the right of superiority may be conveyed without property, some gentlemen hold superiorities who have no property in the county. In the vicinity of the castle of Lochmaben small parcels of rich and fertile land called Four Towns are held by a very antient and peculiar mode of kindly tenure, and are transferred simply by possession. The proprietors pay a small fixed sum annually to the earl of Mansfield. Feu-holding, which enables the owner to alienate at pleasure, and subjects him to an annual payment equal and sometimes superior to rack-rent, is mostly confined to houses and gardens. Near the royal burghs certain tracts of land are held under burgage tenure. The owners of these pay every year a certain sum as rent or duty to the magistrates of the burghs. Tithes, or teinds, as they are called, are very light. By an act of the Scottish parliament, dated 1663, a fifth part of the rent was directed to be returned as the tithe, and fixed as a money payment; the valuations to be made at the request of the landowners. In consequence of the depreciation of money and the increase of the value of land, the tithes are considered exceedingly moderate. The rental of a great portion of land has been more than doubled within the last forty years. Though several landlords have lately made considerable reductions, many farms, on account of the reduced price of produce, are over-rented, and for want of capital the farmers are unable to make improvements. Long leases of small portions of land for building are very common in villages. Farms of arable land are generally let on leases of 15, 19, or 21 years. On sheep farms the ordinary leases are from 9 to 13 years. Various forms of leases are in use. Some landowners have printed conditions, which are seldom read or attended to by the tenants, except so far as regards the rent and term of the lease. There is a kind of rule that not more than one third part of the arable land shall be under white crops, yet some adopt the four-field and others the six-field course of husbandry. A variety of crops are now cultivated, and the practice of farmers with respect to rotation is various. Some very judiciously endeavour to suit their rotation and course of management to the different soils; others, by altering the rotation or by varying the genera or species of the crops, adopt a double rotation. The following is a frequent order of husbandry: 1st year, oats; 2nd, potatoes and turnips, the latter fed off by sheep; 3rd, wheat or barley, and sown with grass seeds; 4th, hay; 5th, grass. Oats and potatoes are cultivated more extensively than any other crop, both for home consumption and for exportation. Potatoes are much used in fattening cattle and pigs. A great quantity of hams and bacon of the very best quality are cured in this county, and sent off to the Liverpool, London, and Newcastle markets. The very general adoption of the culture of turnips has lately been one of the greatest improvements in agriculture. Bone manure is used with advantage upon high ground of difficult access. The farm implements in use are very similar to those in Cumberland, with the exception of the sickle, the [illegible] of which is in some places much laid aside, and the the substituted for it. The horses in general are of a ddle size, and are the result of many crossings of different breeds. The quality of the cattle and sheep stocks has been lately much improved. The Galloway breed of cattle mostly prevails, except for the dairy, for which business most intelligent farmers prefer cows of the Ayrshire breed. The sheep are of the Cheviot and black-faced breeds, but there are not many of them perfectly pure and unmixed. Latterly they have been crossed by the Leicesters, and when the land has been drained, which is usually by open drains, the offspring are found to answer exceedingly well, and make more profitable returns to the farmer. The native breed of dun-faced small sheep does not now appear in the county. A great number of pigs are kept by the farmers and cottars, and bacon may be considered a staple commodity of the county. Grass lands are generally entered upon at Whitsuntide; and corn lands in August after the removal of the crop. The rent is payable at Whitsuntide and Martinmas in equal portions. Sheep farms vary in size from 300 to 3000 acres, and two sheep for three acres may be considered an average number of stock. The management of these is by far the least expensive branch of farming, though a good deal more is necessary than the shepherd and his dog. Arable farms extend from [illegible] to 600 acres; many are about 100 or 150 acres. Some farms contain both sheep-walk and arable lands, and these are considered the most convenient and productive. Arable farms, and those of small size, prevail on the low grounds and near the market towns and villages. Those of large extent, where pasture greatly preponderates, are more distant, and more highly situated. The rent of land varies according to quality and situation. Arable land in a good situation lets from 2*l.* to 5*l.* per acre, but about 1*l.* per acre may be considered an average of the county for arable lands, and 4*s* for sheep-walk. The annual value of real property, as assessed in 1815, was 295,621*l.*

Most of the modern farm buildings are commodious and well arranged; they are constructed of stone and lime, and generally covered with slate. Very few are now thatched with straw or built of clay as formerly. Great improvements have been also made in the churches, schools, roads and fences. There are two or three district farming societies, but no general agricultural association for the county. These societies have been very useful by stimulating attention to the improvement of stock. The present depressed state of agriculture bears hard on the peasantry, who are intelligent, frugal, and industrious people. A remarkable difference exists in the food provided by the farmers in England and in Dumfriesshire for their labourers. In Dumfriesshire the haymakers, reapers, &c. have oatmeal porridge, milk, potatoes, and broth, but no meat except a piece of bacon boiled in the broth to give it a relish. The grey plaid thrown round the body is very common. The popular games are curling in winter, and quoits in summer. Married servants generally reside in a cottage near the farmer's house, and are furnished with a quantity of oatmeal, potatoes, and peats. They have also a cow's grass each, and supplies of money, the whole supposed to be worth about 35*l.* a year. House servants are engaged at hiring fairs at a fixed wage, for six months, for which period men have about 6*l.*, and women 3*l.* The people are very sensible of the benefits of education, and can almost all read and write. In the country parishes, as well as in burghs and large villages, there are parish schools, in which not only the ordinary branches of education, but also the classics and French are generally taught. A few of them are well endowed, but the emoluments on an average do not perhaps exceed 50*l.* each. The poor in the country are relieved by the ministers and elders from funds collected in alms at the church doors, voluntary donations, and small fines. In many parishes sums of money have been bequeathed, or mortified, as it is termed, for the use of the poor. The great evil of this system is constant and uninterrupted public begging, the only remedy for which would be to enforce residence in the parishes where the poor are known. In a few parishes on the border a rate is levied, and paid in equal proportions by the landlords and tenants. The independent disposition which induced the poor to refrain from seeking parochial relief, it is feared, is fast wearing [illegible]. The practice of making salt by filtering the sea-[illegible] sleetch, for which the inhabitants had a right of exc[illegible], has altogether ceased along the coast since the removal of the salt duty.

Fairs.—The county town has three annually, for [illegible] and black cattle, February 13th and September [illegible] these days fall on Wednesday; if not, the Wednesday after; and Martinmas Wednesday. The last is chiefly for fat cattle, and for hiring servants. There are markets here also for cattle on Wednesdays, from the beginning of April to the end of December. For lambs: Langholm, July 26th; Lockerbie, August 16th and October 16th, excepting Saturday, Sunday, or Monday, and in that case on the Tuesday following. For sheep: Langholm, September 18th. For tups, sheep, lambs and wool: Sanquhar, July 17th, if Friday; if not, on Friday after. For tups: at Moffat in the latter end of June; at Annan in May and October; at Moffat in March and October; and at Lockerbie in April; and fourteen days after Michaelmas are fairs for hiring servants.

Formerly a very singular custom was observed at a fair held at the meeting of the White and Black Esks. At that fair, it was the custom for unmarried persons of both sexes to choose a companion according to their liking, with whom they were to live till that time next year: this was called *hand-fasting*. If they were pleased with each other at that time, they continued together for life; if not, they separated, and were free to make another choice as at first.

Divisions, Towns, &c.—There is no division of the county for political purposes, but within its limits are four royal burghs, Dumfries, Annan, Lochmaben, and Sanquhar. The natural division is into the districts or dales of the three principal rivers; Nithsdale, Annandale, and Eskdale.

Langholm is a well built town delightfully situated in the bosom of some picturesque woodland and mountain scenery on the banks of the Esk. It consists of one principal street, in which is a town-hall and jail in the market-place; and the village of New Langholm on the opposite side of the river. The castle, which is now in ruins, has only been a square tower. There is an old church, two dissenting meeting-houses, an endowed school, and a savings'-bank. The late Mr. Telford, civil engineer, left 1000*l.* to the Langholm library, and as there are two libraries, the legacy is in dispute between them. There are also two woollen manufactories and a small whiskey distillery. Wednesday is the market day. Parish population 2676. A handsome monument has lately been erected by subscription on Langholm Hill to the memory of the late Sir John Malcolm. The principal mansion-houses in the vicinity are Langholm-lodge, Broomholm, Burnfoot, and Westerhall. Near the old castle is a place where several reputed witches were burnt in the last century, some of whom, it is said, acted as midwives, and had the power of transferring the pains of labour from the mother to the father.

Moffat, a celebrated watering-place, stands on very dry and gravelly ground, which gently declines towards the south, near the river Annan, 20 miles north by east of Dumfries. It is protected on the north-east by a noble screen of lofty mountains. Here are elegant baths, assembly-rooms, a church and burgher meeting-house, a subscription and a circulating library. Parish population in 1831, 2221. A weekly market is held on Friday. The seat of Rae-hills is about eight miles distant. Among the places in the vicinity noted for fine scenery, and much visited by strangers for the purpose of recreation, are the old caves at Newton; Earl Randolph's tower; Craigie wood; Bellcraig rock and lin, and Gray Mare's Tail. The sulphureous water of Moffat, according to the analysis of Dr. Garnet, contains 4 cubic inches of nitrogen gas in the wine gallon, 5 cubic inches of carbonic acid gas; 10 cubic inches of sulphureted hydrogen gas; and 36 grains of sulphate of soda. The chalybeate water of Hartfell, according to the analysis of the same chemist, contains 5 cubic inches of azotic gas in a wine gallon; 84 grains of sulphate of soda, 12 grains of sulphate of alumina, and 15 grains of oxide of iron. The sulphureous water is found of great service in scrofula, cutaneous eruptions, and bilious complaints; the chalybeate in disorders of the stomach and bowels, and in those connected with local and general debility.

Lochmaben is a very antient burgh and market town seated on the west side of the Annan. It was several times plundered and burnt by the English. It consists chiefly of one broad street, and is governed by a provost, three bailies, a dean of guild, a treasurer, and nine ordinary councillors. The revenues are very small. The town-hall, under which is the jail and lockup-house, was built in 1745. A handsome and substantial new church was erected in 1819. It possesses also a burgher chapel, a subscription library, and an endowed school. Population 1000; 39 of whom are electors under the Reform Act. During the winter there is a weekly market for pork, in which business is done to a large amount. The castle, now in ruins, has been a place of great strength, the fortification covering nearly 16 acres.

Lockerbie is a market-town situated between the rivers Annan and Milk, 12 miles east of Dumfries. The number of inhabitants is 1414. There is a good parish church, and also an antiburgher meeting-house, a library, and a public reading-room. The old tower was lately converted into a temporary lockup-house. Thursday is the market day. The winter weekly markets are principally for pork.

Sanquhar, a royal burgh, is seated on the Nith, 27 miles south-west of Dumfries. It has a handsome church, erected in 1820, and three dissenting places of worship; a prison, savings'-bank, and a subscription library. The castle is a very picturesque ruin. The town is governed by a provost, three bailies, a dean of guild, a treasurer, and eleven ordinary councillors. Revenue about 40*l.* yearly. The only manufacture, except weaving and sewing of muslin to a certain extent, is a carpet manufactory at Crawick-mill. Parish population in 1831, 3268. The town about 1400. The number of electors of the burgh was 50. At Eliock-house, in this parish, was born the Admirable Crichton.

Ecclefechan is a neat village on the Glasgow and London road, on which a market is held every month on a Friday, and a pork market weekly. In its vicinity are Hoddam-castle, and the Tower of Repentance.

Graitney or Gretna Green, a neat small village long celebrated for the clandestine marriages of fugitive lovers, is situated within a mile of the English border; on which border is also Solway-moss, remarkable for a disastrous battle in the time of Henry VIII., and for a sudden and overwhelming eruption that took place in 1771.

Divisions for Ecclesiastical and Legal purposes. The synod of Dumfries extends over the whole county, and also over a part of some other counties. It comprehends fifty-three parishes, forty-two of which are in this county. The next court in authority is a provincial synod, which consists of all the clergy of the established church, and one elder from each parish. The synod of Dumfries comprehends five presbyteries, viz. Dumfries, Lochmaben, Annan, Penpont, and Langholm. The number of clergymen within its limits is fifty-four, and of these forty-three are in this county. Prior to the year 1756, there were three jurisdictions in the county, viz. the sheriffship of Nithsdale, the stewartry of Annandale, and the regality of Eskdale. Since then one sheriff, whose authority extends over the whole county, has been deputed by the crown. He appoints a deputy, and holds office during life and good conduct. The sheriff-court for the county and the commissary court are held every Tuesday during the session; the sheriff small debt court every second Thursday throughout the year; and the justice of peace small debt court every second Monday.

The county sends one member to parliament, and the burghs of Dumfries, Annan, Lochmaben, and Sanquhar join with Kirkcudbright in electing another representative. Three newspapers are published weekly at Dumfries, the county town..

Antiquities, History, &c. The remains of Druidical temples exist in the parishes of Holywood, Graitney, Eskdalemuir, and Wamphray. Near Moffat are vestiges of a British encampment and also of a Druidical temple. A Roman way has extended from Carlisle by Graitney through the procestrium of the station at Burnswark. This way afterwards divided into two branches; one of which took the route of Nithsdale, and the other of Annandale. They united again at or near Crawford castle. Another Roman way led from Carlisle by the station at Netherby and Liddel-strength through Canobie into Teviotdale. Several fortifications, both of a circular and square form, and some large Roman encampments can be distinctly traced in various parts of the county. At Castleo'er or Overby is a very complete encampment of an oval form supposed to be of Saxon origin, and at Raeburn-foot is a Roman camp which probably communicated with those of Middlebie and Netherby. There are ruins of many old towers, vestiges of forts, and a great number of cairns or burians in different places. The most remarkable towers are at Achincass, Lag, Amisfield, Robgill, and Lochwood. At Dryfesdale is the most entire British fort, and at Burnswark-hill near Ecclefechan are very distinct remains of Roman encampments. There are many moats or artificial mounts on which the people are supposed to have met to [illegible] one of the king's train at Flodden in September, [illegible] after which we find no farther mention of Dunbar's name in the treasurer's accounts, or other like records. He is supposed to have died about the year 1520.

Whether he at last obtained the great object of his desires does not appear. His remaining works do not show that he ever did. On the contrary, they contain many supplications for a benefice, and many lamentations for the want of one; and the various forms and characters of these poems display not a little of that [illegible]

[illegible] and parish of S[illegible] of Tay, in the [illegible] along the [illegible] The town is [illegible] 42 miles north-north-west [illegible] It stands on a gentle acclivity rising [illegible] towards a high hill at the back, called the [illegible]

The antient Gaelic name, still used by the High[illegible] is *Ailec* (beautiful). In the Latin annals of [illegible] Boethius it is Alectum. Buchanan names it Taodunum [illegible] of the Tay), and in several antient records it is variously called Dondé, Dondie, and Donum Dei. The place, [illegible] a fishing village, became a fortress with walls, gates, [illegible] castle, and was the residence of several kings of Scotl[illegible] In various civil wars it suffered severely, and was repeatedly [illegible] and burned; however, it always speedily [illegible] and has long been noted [illegible] and prosperity. W[illegible] it was one of the [illegible] in Scotland [illegible] siege of [illegible] General Monk [illegible] promoted by the importation and manufacture of Russian hemp and flax. Of late years the business in this branch of trade has greatly increased. The fabrics are chiefly of a coarser description, as sacking, sail-cloth, &c., of which large quantities are made for exportation; but finer and bleached linens are also extensively manufactured. Thirty-eight spinning-mills are driven by steam, and employ a great number of persons, principally children. There is an iron-foundry, machine-factories, several sugar-refineries, candle manufactories, and much rope-making and ship-building. In 1836, the total tonnage of vessels which entered the harbour amounted to 182,512; and the exports of linen and hempen goods were to the amount of 158,202 tons. In 1832 the tonnage of vessels belonging to the port was 32,864, and the number of seamen employed 2080. Nine vessels are employed in the whale-fishery of Greenland.

Dundee is the chief seat of the Scotch and indeed of the British linen manufacture. The business commenced about the middle of the last century. *In 1745 the importation of flax was only 74 tons. From that period to the present the amount of imports and exports has annually increased in a most astonishing ratio.* The increase is mainly attributed to the introduction of spinning machinery, by which the whole price of the thread is now reduced to less than the mere cost of spinning by the old hand-wheel.

In 1831 the number of spinning-mills worked by steam in the town was 31, exclusive of many in the suburbs. The present number exceeds 50. In the last census of the county of Forfar, the number of males of the age of 20 and upwards engaged in the linen manufacture in Dundee is stated to have been 3160. In 1848 there were 25,150 tons of hemp and flax imported, and the number of pieces of sheetings, bagging, sail-cloth, sacking, and dowlas exported was 516,761, containing about 70,000,000 yards, and worth about 1,000,000*l.*, being considerably greater than the whole exported from Ireland. To show the amazing progress of the trade of Dundee, it may be mentioned that persons now living once farmed the harbour dues at 40*l.* a year, which now bring about 16,000*l.* (MacCulloch's *Statistics of the British Empire*, vol. ii. p. 96.) The Frith, opposite the town, is two miles in width, and is crossed every half hour by an enormous double steam-boat of a peculiar and very commodious construction. The dangerous and numerous sand-banks in the estuary are avoided by excellent charts of the soundings, two lighthouses, and several beacons. The present docks and quays have cost [illegible], and further improvements are suggested. Besides a number of smacks, steamers sail regularly to London, two of which have engines each of 175 horse power.

A railway communicates with Newtyle, in Strathmore, and passes through the Law by a tunnel.

The town consists of a spacious market-place and six principal streets diverging from it. In the older parts the houses are closely packed together, but many, especially in the western extremity, are large airy mansions with ornamental gardens. Numerous improvements are going on in the appearance and convenience of this highly prosperous town. It is lighted with gas, is well paved, is abundantly supplied with spring water, and has several well attended schools. The finest public buildings are the Exchange, the Trades' Hall, and the Town House.

Besides a good parochial school, there is a public academy conducted by superior masters, a royal infirmary, dispensary, lunatic asylum, and several incorporated benevolent institutions. The lofty square Gothic tower of the spacious old church is a conspicuous object at a great distance. There are three other churches, or chapels of ease, a Gaelic church, and several dissenting chapels.

Dundee has produced many eminent ministers. At the Reformation it was distinguished for its Protestant enthusiasm, though before that event, when the population was comparatively very small, there were ten Catholic churches, four monasteries of friars, grey, black, and red, and a nunnery. Among the distinguished persons born or educated here may be named, Hector Boethius, Fletcher of Saltoun, Dempster, Admiral Duncan, Sir William Wallace, the Earl of Mar, and the poet Fergusson. Dundee was made a royal burgh by William I. in 1165, and returns one member to parliament. Population in 1831, 45,355; at present it is probably 60,000.

DUNFERMLINE (pronounced Dunfarlane, and signifying fort of the crooked stream), a town and parish of Scotland, in the shire of Fife, 15 miles northwest of Edinburgh and 3½ miles north of the Frith of Forth. It is 3 miles from the sea, and 275 feet above its level, commanding magnificent and extensive views of the windings of the Forth and of the principal hills of the south of Scotland. It is a place of great antiquity. King Malcolm Canmore founded here a very spacious and superb Benedictine monastery, of which the extant ruins, with those of his palace and castle, are objects of much interest to the antiquarian. After the celebrated Iona, or Icolmkill, the abbey church of Dunfermline was the common cemetery of the Kings of Scotland. In 1818 the skeleton of King Robert Bruce, measuring above six feet in length, was discovered, and a cast was taken of the cranium. This Abbey was the most eminent in Scotland and was very richly endowed, and possessed of peculiar privileges. The Fratery with its fine Gothic window still indicates the grandeur of the original buildings. (Grose's 'Antiquities of Scotland,' fol., vol. ii.) The Guildhall is a fine building with a lofty spire.

The town was made a royal burgh by James VI. An extensive business is carried on in the manufacture of diaper and fine table-linen; the value of the quantity annually manufactured is about 200,000*l.* The parish contains a large coal-field and collieries, the property of the Earl of Elgin, and in the town are several breweries, an iron-foundry, and candle and tobacco manufactories.

Dunfermline is the principal seat of the manufacture of the finer sorts of linen fabrics, as diapers, damasks, and table-linen. The thread is spun by machinery. Of late years the beauty of the patterns and the fineness of the goods have been much improved, and the manufacture has greatly increased. In the census of 1831 it is stated that 2700 males of the age of 20 and upwards were then employed in the linen manufacture in this town.

The situation is picturesque, and the houses are intermingled with luxuriant trees, over which the spire of the Abbey church rises to the height of [illegible] feet. The western suburb is composed of superior houses. An octagonal meeting-house, built for the celebrated minister, Ralph Erskine, is a conspicuous object in approaching the town. There are several beneficent institutions and schools, and two public subscription libraries. The streets are paved and lighted with gas. Population in 1831, 27,892.

DUNG. [MANURE.]

DUNGANNON. [TYRONE.]

DUNGARVAN. [WATERFORD.]

DUNKELD. [PERTHSHIRE.]

DUNKERQUE, or as it is not unfrequently written by the English, **DUNKIRK**, a town in France, capital of an arrondissement in the department of Nord. It is on the sea, about 150 miles in a straight line north of Paris, or 165 miles by the road through Clermont, Amiens, Doullens, St. Pol, Aire, Hazebrouck, Cassel, and Bergues: in 51° 3′ N. lat. and 2° 22′ E. long.

This place is said to owe its origin to a chapel founded by St. Eloi, which, from its situation among the sandy downs of the coast, took the name of *Dun-kirk*, *i.e.* the church of the downs. In the 10th century, by the favour of Baudouin or Baldwin III., called Le Jeune, Count of Flanders, it was raised from a mere village to the rank of a town. In the records of the 12th century it is mentioned by the names Dunkerca, Dunekerca, and Dunkerca. In the 14th century a castle was built here by Robert count of Flanders, but it was demolished in a revolt of the Flemings, or perhaps by their supporters the English, who burnt the town in 1388. Another castle, built in 1538, to defend the port, by Charles V., to whom it had come with the rest of Flanders by inheritance, has also been demolished. In 1558 the English, who had rendered themselves masters of the town, were driven from it by the French under the Marshal de Thermes; but in the following year it was given up to the Spaniards by the treaty of Le Château-Cambresis. In 1646 it was taken after a short siege by the French under the duke of Enghien (better known by his subsequent designation of the Great Condé), in spite of the vigorous defence of the Marquis de Leyde, the Spanish governor; but it fell again shortly after into the hands of the Spaniards. In 1658 Turenne, having defeated the Spaniards at the battle of the Downs (bataille des Dunes), took Dunkerque, which, according to a treaty previously concluded with Cromwell, was put into the hands of the English: four years afterwards the needy Charles II. restored it to France on condition of receiving for it a considerable sum of money. Louis XIV., sent day it is become of great military importance, from the strength which has been given to its fortifications. Dünaburg contains a Greek and two Roman Catholic churches, and a synagogue, a suppressed Jesuits' college, and a population of about 4200. It has three fairs in the course of the year, and carries on considerable trade.

DUNBAR. [HADDINGTON.]

DUNBAR, WILLIAM, is supposed to have been a grandson of Sir Patrick Dunbar, of Beil, in the shire of Haddington. This Sir Patrick Dunbar was a younger son of George, tenth earl of March. He was thus also a younger brother of George, eleventh earl, who was attainted in an arbitrary manner, and had his possessions forfeited by King James I. in the parliament held at Perth on the 10th of January, 1434-5; and it appears that Dunbar, being involved in the common ruin of the house, lived in a state of great dependence without any patrimonial inheritance.

The path of ambition in those days, and the road to wealth and honours, was the church, to which Dunbar was destined from his earliest years. In 1475 he was sent to the university of St. Andrews, where he passed bachelor of arts, in St. Salvator's college there, in 1477; and in 1479 master of arts.

He afterwards entered the monastic order of St. Francis; and in the habit of a friar travelled not only throughout the south of Scotland, but also into England and on the continent. From his writings we learn that he was frequently employed abroad in the king's service, but in what capacity does not precisely appear. It was in all likelihood as a *clerk* in some of the numerous missions despatched by King James IV. to foreign courts. Of his own fidelity to his royal master on these occasions he entertained a tolerably high opinion; and few opportunities escaped of his reminding the king of the nature and extent of his services, with not merely distant hints, but direct intimations of the propriety of a recompense. It was no doubt with a view to this, but partly also, and perhaps mainly, to remunerate his higher labours of the intellect and fancy, to reward his literary merit, and to attach him to the person of the king, that, on the 15th of August, 1500, he had a grant from his majesty of an annual provision of 10*l.* during his life, or until he should be promoted to a benefice of the value of 40*l.* or more yearly.

In the year 1501 he was again in England, probably in the train of the ambassadors who were sent thither to conclude the negotiations for the king's marriage. The preparations for this marriage began on the 4th of May, 1503; and upon the 9th of that month Dunbar composed his poem of 'The Thistle and the Rose,' a rich and elegant allegory in celebration of the union. On the 7th of March following he said mass for the first time in the royal presence, and received a liberal gift as the king's offering on the occasion. In the year 1505 he also received a sum from the king in addition to his stated pension; and both that year and the next a sum equal each time to his half-yearly allowance in lieu of his 'yule-gown.' In 1507 his pension was doubled; and besides occasional marks of the royal bounty, he had a letter under the privy seal in August, 1510, increasing the sum to fourscore pounds a year, and until he should be promoted to a benefice of 100*l.* or upwards. This allowance he continued to receive, with other gifts, till the time of the king's death at Flodden in September, 1513, after which we find no farther mention of Dunbar's name in the treasurer's account, or other like records. He is supposed to have died about the year 1520.

Whether he at last obtained the great object of his desires does not appear. His remaining works do not show that he ever did. On the contrary, they contain many supplications for a benefice, and many lamentations for the want of one; and the various forms and character of these pieces display not a little of that fertility of invention by which Dunbar is distinguished. He seizes every occasion and seems to exhaust every expedient to rouse the king to bestow upon him the long-cherished wish of his heart. A singular one is the poetical address to the king by Dunbar in the person of 'an auld grey horse' worn out in the royal service, and to the petition is appended the king's reply, written, as it seems, by Dunbar himself, in the hope, no doubt, that the king would adopt it as his own. In modern orthography the reply runs thus:—

'After our writings, treasurer,
Take in this grey horse, old Dunbar,
Which in my *aucht* with service true
To lyart changed is his hue.
Gar house him now against this yule,
And busk him like a bishop's mule;
For with my hand I have indost
To pay whate'er his trappings cost.'

Dunbar's writings now extant are not numerous, but they exhibit an amazing versatility of genius, from grave to gay, from witty to severe. At one time we find him the sober moralist supporting the weak, instructing the ignorant, warning the rash; at another, indulging in all the immodesty of licentiousness. But it is in description that he shows his various powers most conspicuously. Thus, in his 'Golden Terge,' as in 'The Thistle and the Rose,' we have imagery brilliant and dazzling. In the 'Dance of the Deadly Sins in Hell,' the same creative hand appears. 'The Feigned Friar of Tungland' and 'The Justs between the Taylor and the Souter' display the same power of vividly portraying character, mingled with bitter sarcasm and biting satire. And in the doggerel lines 'On James Dog' we see the burly wardrobe-keeper pass before us, and feel

'His gang gars all the chalmer schog.'

The existence of Dunbar's works is a signal proof of the immortality of real merit. We know not at what precise time he was born, nor when he died; his very name, it has been remarked, is, with one solitary exception, not to be met with in the whole compass of our literature for 200 years, and it is only after the lapse of three centuries that his poems have been collected and published; and yet he now once more stands forth as one of the very greatest of Scotland's poets.

DUNBLANE. [PERTHSHIRE.]

DUNCAN, ADAM, was born July 1, 1731, at Dundee, of which his father was provost in 1745. By the mother's side he was descended, through the Haldanes of Gleneagles from the earls of Lennox and Menteith. He entered the navy in 1746, was made post-captain in 1761, and distinguished himself in several actions, especially at that of Cape St. Vincent. In 1787 he became a rear-admiral, and seven years afterwards was appointed to command in the North Seas. In this service he watched the mouth of the Texel, where a large Dutch fleet lay at the time of the mutiny at the Nore. By skilful manœuvring, although deserted by every ship except one (Adamant, 50), he detained them until he was joined by the rest of the fleet, and, on their leaving port, cut off their retreat and brought them to action at Camperdown, where he captured nine sail of the line and two frigates. For this service Admiral Duncan was created a viscount and received the thanks of parliament. He died suddenly, August 4th, 1804. By his lady, the daughter of Lord President Dundas, he left two sons and several daughters. His eldest son was created earl of Camperdown, at the coronation of William IV. His youngest, Sir Henry Duncan, was principal storekeeper to the Board of Ordnance, and died in 1835.

DUNDALK. [LOUTH.]

DUNDEE, a large seaport town and parish of Scotland on the north shore of the Frith of Tay, in the shire of Forfar. The parish extends 6 miles along the shore, and is from 1 to 4 miles in breadth. The town is in 56° 27′ N. lat. and 3° 3′ W. long., 42 miles north-north-west from Edinburgh. It stands on a gentle acclivity rising from the water-edge towards a high hill at the back, called the Law.

The antient Gaelic name, still used by the Highlanders, is *Ail lec* (beautiful). In the Latin annals of Hector Boethius it is Alectum. Buchanan names it Taodunum (
of the Tay), and in several antient records it is variously called Dondé, Dondie, and Donum Dei. The place, from a fishing village, became a fortress with walls, gates, and castle, and was the residence of several kings of Scotland. In various civil wars it suffered severely, and was repeatedly plundered and burned: however, it always speedily recovered from these disasters, and has long been noted as a place of commercial opulence and prosperity. When, 1645, it was sacked and burned, it was one of the richest towns in Scotland; and when, after a siege of six weeks, it was taken by Cromwell's officer, General Monk, six vessels in the harbour were laden with the spoil, and each soldier's share was 60*l.* The commerce of Dundee has been remarkable for its successive adoption of different speculations. About forty years ago leather was a principal article, and 7000*l.* worth of shoes were annually exported. This trade is now extinct. At one time several companies successfully prosecuted the cotton manufacture, which was succeeded by woollens; but the permanent prosperous commerce and trade of this town have

produced by the importation and manufacture of Russian hemp and flax. Of late years the business in this branch of trade has greatly increased. The fabrics are chiefly of a coarse description, as sacking, sail-cloth, &c., of which large quantities are made for exportation; but finer and bleached linens are also extensively manufactured. Thirty large spinning-mills are driven by steam, and employ a great number of persons, principally children. There is an iron-foundry, machine-factories, several sugar-refineries, candle manufactories, and much rope-making and ship-building. In 1830, the total tonnage of vessels which entered the harbour amounted to 182,512; and the exports of linen and hempen goods were to the amount of 464,752 tons. In 1832 the tonnage of vessels belonging to the port was 32,868, and the number of seamen employed, 3500. Nine vessels are employed in the whale-fishery of Greenland.

Dundee is the chief seat of the Scotch and indeed of the British linen manufacture. The business commenced about the middle of the last century. In 1745 the importation of flax was only 74 tons. From that period to the present the amount of imports and exports has annually increased in a most astonishing ratio. The increase is mainly attributed to the introduction of spinning machinery, by which the whole price of the thread is now reduced to less than the mere cost of spinning by the old hand-wheel.

In 1831 the number of spinning-mills worked by steam in the town was 31, exclusive of many in the suburbs. The present number exceeds 50. In the last census of the county of Forfar, the number of males of the age of 20 and upwards engaged in the linen manufacture in Dundee is stated to have been 3300. In 1835 there were 25,159 tons of hemp and flax imported, and the number of pieces of sheetings, bagging, sailcloth, sacking, and dowlas exported was 618,707, containing about 70,000,000 yards, and worth about 1,600,000*l.*, being considerably greater than the entire exports from Ireland. To show the amazing progress of the trade of Dundee, it may be mentioned that persons now living once farmed the harbour dues at 400*l.* a-year, which now bring about 10,500*l.* (MacCulloch's *Statistics of the British Empire*, vol. ii. p. 90.) The Frith, opposite the town, is two miles in width, and is crossed every half hour by an enormous double steam-boat of a peculiar and very commodious construction. The dangerous and numerous sand-banks in the estuary are avoided by excellent charts of the soundings, two lighthouses, and several beacons. The present docks and quays have cost 200,000*l.*, and further improvements are suggested. Besides a number of smacks, steamers sail regularly to London, two of which have engines each of 125 horse power.

A railway communicates with Newtyle, in Strathmore, and passes through the Law by a tunnel.

The town consists of a spacious market-place and six principal streets diverging from it. In the older parts the houses are closely packed together, but many, especially in the western extremity, are large airy mansions with ornamental gardens. Numerous improvements are going on in the appearance and conveniences of this highly prosperous place. It is lighted with gas, is well paved, is abundantly supplied with spring-water, and has several well attended markets. The finest public buildings are the Exchange, the Trades' Hall, and the Town House.

Besides a good parochial school, there is a public academy conducted by superior masters, a royal infirmary, dispensary, lunatic asylum, and several incorporated nevolent institutions. The lofty square Gothic tower of a spacious old church is a conspicuous object at a great stance. There are three other churches, or chapels of e, a Gaelic church, and several dissenting chapels.

Dundee has produced many eminent ministers. At the rmation it was distinguished for its Protestant en- siasm; though before that event, when the population comparatively very small, there were ten Catholic rches, four monasteries of friars, gray, black, and red, a nunnery. Among the distinguished persons born educated here may be named, Hector Boethius, cher of Saltoun, Dempster, Admiral Duncan, Sir liam Wallace, the Earl of Mar, and the poet Ferguson. undee was made a royal burgh by William I., in 1165. turns one member to parliament. Population in 1831, 55; at present it is probably 50,000.

DUNFERMLINE (pronounced Dumferline, and signifying fort of the crooked river), a town and parish of Scotland, in the shire of Fife, 15 miles north-west of Edinburgh, and 2½ miles north of the Frith of Forth. It is 3 miles from the sea, and 270 feet above its level, commanding magnificent and extensive views of the windings of the Forth and of the principal hills of the south of Scotland. It is a place of great antiquity. King Malcolm Canmore founded here a very spacious and superb Benedictine monastery, of which the extant ruins, with those of his palace and castle, are objects of much interest to the antiquarian. After the celebrated Iona, or Icolmkill, the abbey church of Dunfermline was the common cemetery of the kings of Scotland. In 1818 the skeleton of King Robert Bruce, measuring above six feet in length, was disinterred, and a cast was taken of the cranium. This Abbey was the most eminent in Scotland, and was very richly endowed, and possessed of peculiar privileges. The Fratery with its fine Gothic window still indicates the grandeur of the original buildings. (Grose's 'Antiquities of Scotland,' fol., vol. ii.) The Guildhall is a fine building with a lofty spire.

The town was made a royal-burgh by James VI. An extensive business is carried on in the manufacture of diaper and fine table-linen; the value of the quantity annually manufactured is about 200,000*l.* The parish contains a large coal-field and collieries, the property of the Earl of Elgin, and in the town are several breweries, an iron-foundry, and candle and tobacco manufactories.

Dunfermline is the principal seat of the manufacture of the finer sorts of linen fabrics, as shirting, damasks, and table-linen. The thread is spun by machinery. Of late years the beauty of the patterns and the fineness of the goods have been much improved, and the manufacture has greatly increased. In the census of 1831 it is stated that 2700 males of the age of 20 and upwards were then employed in the linen manufacture in this town.

The situation is picturesque, and the houses are intermingled with luxuriant trees, over which the spire of the Abbey church rises to the height of 155 feet. The western suburb is composed of superior houses. An enormous meeting-house, built for the celebrated minister, Ralph Erskine, is a conspicuous object in approaching the town. There are several beneficent institutions and schools, and two public subscription libraries. The streets are paved and lighted with gas. Population in 1831, 27,692.

DUNG. [MANURE.]

DUNGANNON. [TYRONE.]

DUNGARVAN. [WATERFORD.]

DUNKELD. [PERTHSHIRE.]

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This place is said to owe its origin to a chapel founded by St. Eloi, which, from its situation among the sandy downs of the coast, took the name of Dùn-kirk, *i. e.* the church of the downs. In the 10th century, by the favour of Baudouin or Baldwin III., called Le Jeune, Count of Flanders, it was raised from a mere village to the rank of a town. In the records of the 12th century it is mentioned by the names Dunkerca, Dunekerca, and Dunikerca. In the 14th century a castle was built here by Robert count of Flanders, but it was demolished in a revolt of the Flemings, or perhaps by their supporters the English, who burnt the town in 1388. Another castle, built in 1538, to defend the port, by Charles V., to whom it had come with the rest of Flanders by inheritance, has also been demolished. In 1558 the English, who had rendered themselves masters of the town, were driven from it by the French under the Marshal de Thermes: but in the following year it was given up to the Spaniards by the treaty of Le Château-Cambresis. In 1646 it was taken after a short siege by the French under the duke of Enghien (better known by his subsequent designation of the Great Condé), in spite of the vigorous defence of the Marquis de Leede, the Spanish governor; but it fell again shortly after into the hands of the Spaniards. In 1658 Turenne, having defeated the Spaniards at the battle of the Downs (bataille des Dunes), took Dunkerque, which, according to a treaty previously concluded with Cromwell, was put into the hands of the English: four years afterwards (in 1662) Charles II. restored it to France on condition of receiving for it a considerable sum of money. Louis XIV., then king of France, made extraordinary exertions to fortify it, and to repair the harbour; in 1671 thirty thousand men were employed on the works, and its strength enabled the town to repel an attempt made by the English to bombard it 1695. By virtue of the peace of Utrecht, the fortifications were rased and the port filled up. The maritime activity of the people of Dunkerque, and the number of privateers and ships of war which they sent out were probably the inducement to the English and Dutch to require these hard conditions. By the peace of Aix-la-Chapelle the port and fortifications, which had been partially restored in the previous war, were again demolished; but by the peace of 1783 they were allowed to be restored. In 1793 the town was besieged by the allies under the Duke of York; but the victory obtained by the French under General Houchard at Hondscotte obliged the duke to raise the siege and retire, with the loss of 52 pieces of cannon and a large quantity of ammunition.

Dunkerque is separated from the sea by a range of downs: on the land side the town is surrounded by canals. The canal of Bourbourg runs westward to the river Aa: the canal of Furnes runs eastward to Furnes, and so to Nieuport and Bruges, uniting with several of the canals which intersect Belgium. The town of Dunkerque is nearly three miles in circuit. The streets are generally broad, and the houses well built of brick, and whitened or coloured. The place du Champ de Mars is a large and fine square: the place Dauphine is an oblong square planted with trees and adorned with a bust of Jean Bart. [Bart.] The fortifications consist of the ramparts, surrounded by ditches, of Fort Louis, and the Citadel.

The principal building is the church of St. Eloi, which has been ornamented by a fine portico of ten Corinthian columns. The great tower which belonged to the church has been separated from it by continuing the line of the Rue de l'Eglise through the church, which is consequently much smaller than it once was: the new front is formed by the portico just mentioned. The hôtel de ville (town-hall) is an insignificant building. There is a range of barracks and naval storehouses.

The population of Dunkerque in 1832 was 24,937. The inhabitants are engaged in the manufacture of soap, starch, beet-root sugar, cordage, and leather: there are metal foundries, gin distilleries, and salt-works. Snuff was formerly manufactured to a great extent. There are two fairs in the year for linens, woollen cloth, jewellery, hardware, and pottery. The trade by sea is very considerable, especially since it was declared in 1816 a free port. The harbour is large and convenient; but there is a dangerous bar at its mouth. The Newfoundland and Iceland cod fishery, and the herring fishery, are prosecuted with considerable spirit; and the town has a considerable trade in Bordeaux wines and brandies.

Dunkerque has a *tribunal de première instance*, or subordinate law court, and a *tribunal de commerce* for the decision of commercial disputes. There are a high school, schools of navigation, drawing, and architecture, an agricultural society, a learned society under the designation of 'conseil polytechnique,' and a public library of 4000 volumes. There are also a theatre, an hospital, a foundling hospital, and two prisons, one of them military.

The language commonly spoken by the poorer inhabitants is Flemish, but most of them are also acquainted with French, which is the ordinary language of the place.

The arrondissement of Dunkerque is divided into seven cantons, and comprehends sixty communes. It had in 1832 a population of 95,571.

DUNMOW BACON. A custom prevailed at Dunmow, in Essex, and was observed there even as late as the middle of the last century, of giving a flitch of bacon to any married man or woman who would swear that neither of them, in a year and a day, either sleeping or waking, repented of their marriage. Brand, in his 'Popular Antiquities,' vol. ii. pp. 98, 99, has given the rhyming oath which was administered to them upon the occasion. The parties were to take it before the prior and convent of Dunmow and the whole town, kneeling in the churchyard upon two hard pointed stones. They were afterwards carried in procession through the town upon men's shoulders, with the bacon borne before them. The register of Dunmow priory attributes the institution of this ceremony to Robert Fitzwalter, a descendant from Juga, the foundress of the priory, some time in the reign of Henry III., and preserves memoranda of three claims made for the bacon prior to the dissolution of religious houses; namely, in the 7th Edw. IV., in the 23rd Hen. VI., and in 1510, 2nd Hen. VIII. This ceremony is alluded to in the 'Visions of Piers Plowman,' and also by Chaucer in the 'Wife of Bath's Prologue.' (See Brand, ut supr.; Morant's *Hist. of Essex*, vol. ii. p. 429; Blount's *Jocular Tenures*, 8vo., York, 1784, p. 276; Dugdale's *Monasticon*, last edit., vol. vi. p. 149.) The Dunmow Bacon was claimed in 1701, and again in 1751, when a large print was engraved of the ceremonial which took place on the occasion.

DUNN, SAMUEL, was a native of Crediton, Devonshire, where he kept a mathematical school for several years; but he afterwards removed to Chelsea, and occupied himself in the same manner. He was well skilled in practical astronomy, and was a good practical observer, which led to his being appointed mathematical examiner of the candidates for the East India Company's service.

He was the author of several useful and ingenious papers in the 'Philosophical Transactions,' as well as of some separate works on the practical branches of science. He also published a folio Atlas, which has been held in some estimation.

Mr. Dunn bequeathed an estate of about 30*l.* a year to found a mathematical school in his native town, the first master to which was appointed in 1793.

DUNNING, JOHN, Lord Ahsburton, the son of an attorney at Ashburton in Devonshire, was born 18th October, 1731. He was removed from the free-school at Ashburton, and articled to his father as a clerk in the thirteenth year of his age. Sir Thomas Clarke, the then master of the rolls, who employed old Mr. Dunning as his attorney, having observed the young man's capabilities for active business, induced him to study for the bar. He entered the Middle Temple, May 8th, 1752, and was called to the bar, according to the Temple books, July 2, 1756.

Dunning travelled the western circuit for some years without any success; but in 1761, through the good offices of Mr. Hussey, a king's counsel, being appointed to draw up the reply of the East India Company to the Dutch memorial, he acquired some connexions, which were considerably increased by his argument in the case of Combe v. Pitt (Trin. Term, 1763), which he was called upon to make in consequence of the illness of his leader. In the course of the same year the question as to the legality of general warrants arose, in consequence of the arrest of the publishers of the North Briton. Dunning throughout the whole litigation was employed as the advocate of his friend Wilkes; and the argument on the Bill of Exceptions (June, 1765) afforded him an opportunity of establishing his reputation. After this his business rapidly increased: he was shortly chosen recorder of Bristol, and in December, 1767, appointed solicitor-general.

In the following year he entered parliament as one of the nominees of Lord Shelburne for the borough of Calne. A Whig in his politics, and an accomplished constitutional lawyer, Dunning throughout his parliamentary career unflinchingly opposed the Tories. He laboured strenuously to reduce the pension list, but unfortunately for his fame, himself became a pensioner to the amount of [illegible] a year, when, in the spring of 1782, he was raised to the peerage by the title of Baron Ashburton, of Ashburton, in the county of Devon. Possessing the most lucrative practice of the day, which had already enabled him to purchase considerable landed property, and to save a sum little short of 180,000*l.*, and having besides within a week after this promotion possessed himself of a lucrative sinecure, the chancellorship of the duchy of Lancaster, Dunning had not even the poor excuse of poverty for this political profligacy. This venality and want of principle, which so often unfortunately obscure the fair fame of individuals, are not wholly without profit to the public; they afford an example which acts as a warning to them against placing much confidence in the unbounded professions of ambitious and unprincipled men; for however popular, however distinguished may be the name of such a man in his own day, a few short years are sure to consign him to unmerited neglect, if not contempt. Such, as a politician, has been the lot of Dunning. As a lawyer none of his contemporaries enjoyed a higher reputation, or more lucrative practice: his wit appears to have been of that brilliant nature which defies description. In person Dunning was small, and singularly weak and awkward. His action in speaking clumsy and uncouth, but the awkwarness of his gesticulation was soon lost sight of in the interest aroused by his eloquence. Notwithstanding his disadvantages, he was himself extremely vain of his personal appearance, and wished to encourage the belief that his face and figure had irresistible charms in the eyes of the fair sex.

Dunning married in 1780 Miss Elizabeth Baring, the daughter of a retail tradesman at Exeter, by whom he had two sons. The death of the eldest in April, 1783, is supposed to have given so great a shock to the already enervated frame of Lord Ashburton as to have hastened his death, which took place at Exmouth in the August following. When on his journey to Exmouth he is said to have met Wallace, the attorney-general, at Bagshot, who was proceeding to London for medical advice, where he died in the following November. These equally celebrated lawyers, who had been competitors in Westminster Hall, and opponents in parliament, having expressed a strong wish to have a last interview, passed some time in conversation, resting on two sofas, and parted to meet no more.

The title of Baron Ashburton having become extinct, was revived in the year 1834, in the person of the present lord (formerly Mr. Baring), who is a descendant of the Miss Elizabeth Baring mentioned above.

There are notices of Dunning in the 7th vol. of the *Law Mag.*; and in Roscoe's *Lives of Eminent Lawyers*, from which this account is taken.

DUNOIS, a district of Orléanois, in the old territorial division of France. It was bounded on the north by Perche and Chartrain, on the east by Orléanois Proper, on the south by Blaisois, and on the west by Vendômois. Its capital was Châteaudun, which had in 1832 a population of 6461. It is now comprehended in the departments of Eure et Loir, Loir et Cher, and Loiret. In the middle ages this district was a county united with that of Blois, without giving to its owner any separate title; but about the commencement of the fourteenth century Hugues, count of Blois, added to his title that of count of Dunois. Guy, count of Blois and Dunois, sold his counties to Louis, duke of Orléans (brother of Charles VI. of France), whose son Charles bestowed the county of Dunois upon his natural brother Jean, who took so eminent a part in the expulsion of the English from France, under the designation of the Bastard of Orléans, and through whom alone any historical interest attaches to the district.

DUNS SCOTUS, JOHN, was born most probably about the year 1265. The English, the Scotch, and the Irish, have all claimed him as a countryman. According to one of the Irish accounts, he was born at Thathmon or Taghmon in Wexford; according to another, in the town of Down or Downpatrick. The Scotch say he was a native of Dunse in Berwickshire, and in that village they still pretend to show the house where he was born. The English story is, that he was born at a hamlet called Dunston or Dunstance, in the parish of Emilden or Embleton, not far from Alnwick in Northumberland. Camden (*Britannia*, 1096, Gibson's translation, 2nd edit.) affirms this on the authority of an inscription at the end of a manuscript copy of the works of Duns in the library of Merton College, Oxford. But Lord Hailes remarks (*Annals of Scotland*, ii. 124, edit. of 1819), 'This testimony is not sufficient to confute the received opinion; for, in its utmost latitude, it only implies, that an unknown and illiterate transcriber of the works of John Duns chose to make him a native of a place in Emilden in Northumberland called Dunstan, and by a fanciful abbreviation Duns.' In an English translation of one of his treatises ('Idiota's, or Duns' Contemplations of Divine Love,' 12mo., Paris, 1662), the translator, W. B., in a dedication 'to the Right Worshipful Edmund Duns, Esq.,' whom he affirms to be a descendant of the same family that produced Scotus, contends that Duns Scot is merely Dunscot, formed from cot, a cottage, in the same manner with Westcot, Southcot, &c. Mackenzie (*Lives of Scottish Writers*, i. 215) says that he was descended from the family of the Dunses in the Merse. Camden conceives he was called Scotus because descended from Scottish parents. Those who have written of Duns have delighted in allusions to this controversy about the place of his nativity. One of his biographers (Wadding) conceives that it places him above Homer, for the honour of having given birth to whom only cities contended, whereas kingdoms put in their several claims to Scotus. He observes also that the subtlety of the great Doctor may be said to have commenced even before his birth, since no one has yet been able to track him to his first appearance in our world.

It seems, however, to be agreed on all hands that he was chiefly educated in England. He is said to have been found when a boy tending his father's cows by two Franciscans who were greatly struck with his intelligence; and by the monks of this order he was first instructed in the elements of learning, and then sent to Merton College, Oxford, of which in due course he became a fellow. Passing over various stories that are told of him of a legendary cast, we may enumerate in a few lines the authentic events of his life. While yet a student, he is said to have become greatly distinguished for his proficiency in theology, in logic and metaphysics, in civil and canon-law, in mathematics, in natural philosophy, and in astronomy. In 1301, on the removal of William Varron to Paris, he was appointed to the theological chair. His prelections were attended by crowds of auditors, the number of students at Oxford at this time, it is affirmed, exceeding 30,000; 'but among these,' says Anthony Wood, 'a company of varlets, who pretended to be scholars, shuffled themselves in, and did act much villainy in the university by thieving, whoring, quarrelling, &c. They lived under no discipline, neither had any tutors; but only for fashion sake would sometimes thrust themselves into the schools at ordinary lectures; and when they went to perform any mischief, then would they be accounted scholars, that so they might free themselves from the jurisdiction of the burghers.' In 1307 Duns removed from Oxford to Paris, in which city he had on a visit some time before distinguished himself in an extraordinary manner by his defence, in a public disputation, of the doctrine of the immaculate conception of the Virgin Mary. He began, we are told, by demolishing two hundred objections to the doctrine, and concluded by establishing it with a cloud of arguments. A writer who was present, Pelbartus à Temeswar, says that he resolved the knottiest syllogisms of his adversaries as Samson did the bands of Dalilah. The result was the conversion of the whole university to the doctrine thus demonstrated, and the passing of a regulation that no person should afterwards be admitted to a degree without swearing to defend the immaculate conception. On this occasion, it is said, there was formally conferred on Scotus the title of the Subtle Doctor (Doctor vel Magister Subtilis), by which he is commonly distinguished among the schoolmen. He taught in his new chair with as much applause as at Oxford; but he was not allowed to remain long at Paris. In 1308 he was ordered by the general of his order to remove to Cologne to found a new university there. On reaching Cologne he was met by nearly the whole body of the citizens, and drawn into the city in a triumphal car. But his splendid career was now near its close. On the 8th of November, in this same year, he was carried off by a fit of apoplexy. Some accounts make him to have died in his 43rd, others in his 34th year. Paulus Jovius relates that he was buried before he was dead, and that it was afterwards found, upon inspection of the grave, that in his misery he had knocked out his brains against his coffin. Another version of the story is, that he was found to have gnawed the flesh from his arms. This termination of his life has furnished a point for several epigrammatic epitaphs. One by Jacobus Latomus has been thus translated by Dr. Kennet, in Gibson's Camden:

> 'What sacred writings or profane can show,
> All truths were, Scotus, call'd in doubt by you.
> Your fate was doubtful too: Death boasts to be
> The first that choused you with a fallacy;
> Who, lest your subtle arts your life should save,
> Before he struck, secured you in the grave.'

Various separate treatises of Duns Scotus were sent to the press soon after the invention of printing, and several of them have been repeatedly printed. At length, in 1639, his collected works appeared at Lyon, in 12 volumes folio, under the title of 'R. P. F. Joannis Duns Scoti, Doctoris Subtilis, Ordinis Minorum, Opera omnia quæ hucusque reperiri potuerunt, collecta, recognita, notis, scholiis, et commentariis illustrata; à PP. Hibernis Collegii Romani S. Isidori Professoribus, Jussu et Auspiciis Rmi. T. F. Joannis Baptistæ à Campanea, Ministri Generalis.' A complete copy of this collection is exceedingly rare. It is dedicated to Philip IV. of Spain, and the editor is Luke Wadding, an Irishman by birth. It does not however, as has been often stated, contain all the works of Scotus, but only those designated his 'Opera Speculativa,' the 'Positiva,' if they should be completely recovered, having been intended to form a future publication. The principal pieces of which it is composed are Questions or Commentaries on the Sentences of Peter Lombard, and on the physical, logical, and metaphysical writings of Aristotle. There are also a treatise on Grammar; four books (forming a volume) entitled 'Reportatorum Parisiensium;' and a volume of 'Quæstiones Quodlibitales,' the authenticity of which, however, is doubted by Wadding. The following are enumerated by Wadding as the 'Opera Positiva' of Scotus: 'Tractatus de Perfectione Statuum' (of doubtful authenticity); 'Lectura in Genesim;' 'Commentarii in Evangelia;' 'Commentarii in Epistolas Pauli;' 'Sermones de Tempore;' and 'Sermones de Sanctis.' We are not aware that any of these treatises have ever been printed.

The admirers of Scotus extol his acuteness and subtlety as unrivalled, and he has always been accounted the chief glory of the Franciscans, as Thomas Aquinas has been of their rivals the Dominicans. If in his short life he actually wrote all the works that are commonly attributed to him, his industry at least must have been prodigious. His fame during his lifetime, and long after his death, was not exceeded by that of any other of the scholastic doctors. From him and Aquinas two opposing sects in theology took the names of Scotists and Thomists, and divided the schools down almost to the last age. The leading tenet of the Scotists was the immaculate conception of the Virgin; and they also differed from the Thomists on the subjects of free will and the efficacy of divine grace. In philosophy the Scotists are opposed to the Occamists, or followers of William Occam, who was himself a pupil of Scotus, but differed from his master on the subject of Universals or general terms, which the Scotists maintained to be expressive of real existences, while the Occamists held them to be nothing more than names. Hence the Scotists are called Realists, the Occamists Nominalists. It is a favourite opinion of Bayle's, that this doctrine of the Scotists was nothing less than an undeveloped Spinozism. (*Dict. Crit.*, art. 'Abelard,' note C, and 'André Cisalpin,' note B.) It may be added that the English term *dunce* has been commonly considered to be derived from the name of the subtle doctor;—'perhaps,' says Johnson, 'a word of reproach first used by the Thomists, from *Duns* Scotus, their antagonist.' It is worth noting however that a dolt or blockhead appears to be a very modern meaning of the word Dunce or Duns. It does not seem to have been known in this sense, for instance, to Richard Stanihurst, the compiler of the Description of Ireland in Holinshed, who speaks of the name of Scotus being a term 'so trivial and common in all schools, that whoso surpasseth others either in cavilling sophistry or subtile philosophy is forthwith nicknamed a Duns.' This was no doubt the kind of reproach originally intended to be conveyed by the epithet.

Wadding has prefixed to his edition of the works of Scotus an elaborate Life of the author, which was reprinted at Mons in 12mo. in 1644. There is also a 'Tractatus de Joannis Scoti Vita, &c. Auctore R. F. Joanne Colgano, ordinis Fratrum Minorum Hibernorum Paduæ,' 12mo. Antwerp, 1655. Both these works, the latter especially, are full of legendary matter, detailed with the most confiding gravity.

DUNSTABLE, or DUNSTAPLE, a market town in the hundred of Manshead in the county of Bedford, eighteen miles south-by-west from Bedford, and thirty-three miles north-west-by-north from London, situated at the point of contact of the Iknield and Watling Streets. It was in very early times a place of considerable importance. Its modern name is supposed by many etymologists to be derived from Dun or Dunning, a famous robber in the time of Henry I., who with his band became so formidable in the neighbourhood that Henry cut down a large forest in order to destroy their haunts, and built a royal mansion called Kingsbury on part of its site. He also founded a priory of black canons, on whom he bestowed the town of Dunstable and all its privileges in 1131. The priors had a gaol, possessed power of life and death, and sat as judges with the king's justices in Eyre. In 1290 the corpse of Queen Eleanor rested at the market-place, and a handsome cross was erected to commemorate the event; but it was pulled down in the reign of Charles I. as a relic of popery.

Dunstable is situated at the southern extremity of the county, in the centre of the Dunstable chalk downs. It is chiefly celebrated for the manufacture of straw hats, called 'Dunstable hats,' and for its whiting manufactory. The market is on Wednesday, and fairs are held on Ash Wednesday, May 22nd, August 12th, and November 12th. The king is lord of the manor, and the duke of Bedford, his lessee, holds courts leet and baron. The living is a rectory in the archdeaconry of Bedford and diocese of Lincoln. The parish church is now all that remains of the ancient priory; the inside is chiefly Norman, and richly ornamented: over the altar is a large painting of the Last Supper, by Sir James Thornhill. There are two places of worship for Baptists, and one for Wesleyan Methodists.

A charity school was founded by Mr. William Chew in 1727, and has since been endowed by various benefactors: forty boys and fifteen girls are clothed, educated, and apprenticed: the boys are admitted at seven, and apprenticed at fourteen. Six almshouses were founded by Mrs. Chew for the residence of six poor widows; and six others were subsequently founded and endowed by Mrs. Ashton for a similar purpose. Near the church are six houses called 'Maidens' Lodge,' founded in 1713 by Mrs. Blandina Marsh for six unmarried gentlewomen; their income now amounts to 120*l.* per annum. A number of coins of Antoninus and Constantine, as well as other Roman antiquities, have been dug up in the downs in the vicinity of Dunstable.

DUNSTAN, SAINT, was born of noble parents at or near Glastonbury in Somersetshire, in the first year of the reign of Athelstan, A.D. 925. His father's name was Heorstan, his mother's Cynedryda. His earliest instruction in the learning of his time was received in the neighbouring monastery; but afterwards, under the patronage of his uncle, Aldhelm, archbishop of Canterbury, he was introduced at Athelstan's court, where he passed some years. Upon some disgust, he returned to Glastonbury, and having in early youth received the tonsure there, he built for himself a sort of cell or hermitage, with an oratory, employing his time partly in devotional austerities, and partly in the exercise of such manual arts as were useful to the service of the church, in the formation of crosses, vials, censers, vestments, &c. He is also reputed to have painted, and to have copied manuscripts.

Glastonbury having by the successive incursions of the Danes been reduced nearly to ruin, Edmund, the successor of Athelstan, appointed Dunstan to be the abbot of that house, with full power to draw funds from the royal treasury for its restoration. This was in 942, and from a charter granted in 944 the work appears to have been soon accomplished.

In his retreat at Glastonbury, Chalmers supposes that Dunstan's mind was somewhat deranged, and that he indulged chimæras, which being believed by himself and announced to the credulous multitude, established a universal character of sanctity for him among the people. He is said to have fancied that the devil, among frequent visits which he paid him, was one day more earnest than usual in his temptations; till Dunstan, provoked by his importunities, seized him by the nose with a pair of red-hot pincers, as he put his head into the cell, and held him there till the malignant spirit made the whole neighbourhood resound with his bellowings. The people credited and extolled this exploit, which gained Dunstan so great a degree of reputation that he was called again into the world. Edred, the successor of Edmund, in 948, surrendered his conscience, his treasures, and his authority into the hands of Dunstan. Taking advantage of the implicit confidence reposed in him by the king, Dunstan imported into England a new order of monks, the Benedictines, who, by changing the state of ecclesiastical affairs, excited, on their first establishment, the most violent commotions. Finding also that his advancement had been owing to the opinion of his austerity, he professed himself a partisan of the rigid monastic rule, and he introduced that reformation into the monasteries of Glastonbury and Abingdon. This conduct, however, incurred the resentment of the secular clergy, who, joined with such of the courtiers as had become indignant at the haughty demeanor of Dunstan, formed a powerful party against him. Upon the death of Edred, and succession of Edwy, Dunstan was accused of malversation in his office, was deprived of his abbacy, and banished the kingdom in 955. Edgar, however, who succeeded in the following year, restored him to Glastonbury, having promoted him to the see of Worcester; he then made him bishop of London, and in 959 advanced him to the archiepiscopal see of Canterbury. Dunstan repaired to Rome to receive the pall sanction to his appointment, and not only obtained that, but the pope's own appointment of him to be the papal legate in England. Upon his return, so absolute did his influence over the king become, that he was enabled to give the Romish see an authority and jurisdiction of which the English clergy had been before, in a considerable degree, independent. In order more effectually and completely to accomplish this object, the secular clergy were excluded from their livings and disgraced; and the monks were appointed to supply their places. The scandalous lives of the secular clergy furnished one plea for this measure, and it was not altogether groundless; but the principal motive was that of rendering the papal power absolute in the English church; for at this period the English clergy had not yielded implicit submission to the pretended successors of St. Peter, as they refused to comply with the decrees of the popes which enjoined celibacy on them. Dunstan, supported by Edgar's authority, overpowered the resistance which the country had long maintained against papal dominion, and gave to the monks an influence, the baneful effects of which were experienced in England till the Reformation. Dunstan has accordingly been highly extolled by the monks and partisans of the Romish church. During the whole reign of Edgar, Dunstan maintained his interest at court; and upon Edgar's death in 975 his influence served to raise Edward, Edgar's eldest son, to the throne, though the succession of Ethelred, the younger son, was much pressed by Elfrida. Whilst Edward was in his minority Dunstan ruled with absolute sway both in church and state; but upon the murder of that prince in 979, and the accession of Ethelred, his credit and influence declined; and the contempt with which his threatenings of divine vengeance were regarded by the king is said to have mortified him to such a degree, that, on his return to his archbishopric, he died of grief and vexation, May 19th, 988. A volume of St. Dunstan's works was published at Douay in 1626. His ambition has given him a considerable place in ecclesiastical and civil history; and he appears to have been a man of extraordinary talents. (William of Malmsbury's *History;* Henry's *Hist. of Britain*, edit. 8vo., vols. iii. and iv.; the Lives of St. Dunstan in the *Acta Sanctorum* of the Bollandists, month of May, tom. iv., p. 344 to 384; and Chalmers's *Biogr. Dict.*, vol. xii., p. 487-490.) Dunstan's Concord of Monastic Rules is printed at large in Reyner's Apostolatus Benedictinorum in Anglia, fol. Duac. 1626, at the beginning of the third part of the Appendix, p. 77.

DUNWICH. [SUFFOLK.]

DUODECIMALS, a term applied to an arithmetical method of ascertaining the number of square feet and square inches in a rectangular space whose sides are given in feet and inches. For instance, to find the content of 6 feet 7 inches by 2 feet 5 inches, proceed as follows:—

Feet.	Inches.	
6	7	
2	5	
13	2	
2	8	11
15	10	11

In the answer, 15 means 15 square feet; 10 means 10 strips of one foot by one inch, or 10-twelfths of a square foot; 11 means 11 square inches, or 11-144ths of a square foot. The result is obtained as follows:—

2 feet by 6 feet gives 12 square feet.
2 feet by 7 inches gives 1 ,, foot, 2-twelfths, or 14-12ths of a square foot.

13 square feet, 2-twelfths.
6 feet by 5 inches gives 2 square feet, 6-twelfths, or 30-12ths of a square foot.
7 inches by 5 inches gives 2-12ths, 11 sq. in. or 35 square inches.

2 sq. ft. 8-12ths, 11 sq. in.

The following instances are perfectly similar:—

Feet	Inches.		Feet	Inches.
11	10		3	4
12	7		8	6
142	0		26	8
6	10	10	1	8
148	10	10	28	4

DUODE'NUM (from a Latin word signifying twelve, because it is twelve inches in length), the first of the small intestines in immediate connexion with the stomach. It commences at the pyloric end of the stomach, and terminates at the distance of twelve inches in the second portion of the small intestines called the jejunum. Though it is the straightest of the small intestines, yet the duodenum describes in its course various turns. From the pylorus it turns backwards and upwards by the neck of the gall-bladder, with which it is in contact; it then passes obliquely downwards on the right side, immediately before the great vessels which enter the liver. Opposite to the under part of the kidney it makes a turn to the left side, across the lumbar vertebræ, and is lodged in the common root of the mesocolon and mesentery, below the pancreas, and behind the superior mesenteric vessels; it now makes a turn forwards and obtains the name of jejunum.

The duodenum is much more capacious than the jejunum or ilium, and is indeed so larget hat it has been regarded as a second stomach, and obtained the name of ventriculus succenturiatus. It is fixed much more closely to the spinal column than the other intestines, and does not, like them, float loosely in the abdomen. It is of a redder colour than the rest, has a thicker muscular coat, and a greater number of valvulæ conniventes.

At the distance of from three to four fingers' breadth from the pylorus, the duodenum is perforated by the biliary and pancreatic ducts, by which tubes the bile and the pancreatic juice flow into the intestine.

The duodenum is probably an organ accessary to the stomach. There is evidence that it carries on the digestion commenced in the stomach. It is certain that alimentary substances which have escaped solution in the stomach are dissolved in the duodenum.

The chyme formed from the food in the stomach and received by the duodenum, retains the name of chyme until it reaches that portion of the duodenum where the biliary and pancreatic ducts pierce the intestine. At this point, and by the admixture of the biliary and pancreatic juices, the chyme is changed into two portions, into a nutritive portion, which receives the name of chyle, and which flows into the blood [CHYLE], and into an excrementitious portion, which is carried along the small into the large intestines, where it receives the name of fæces, and is expelled from the body.

On the surface of the duodenum the lacteal vessels begin to make their appearance for the absorption of the chyle. [LACTEALS.] The duodenum is likewise provided with a great number of mucous glands, which more especially abound near the pylorus. (*Philosophy of Health.*)

DUPLEX QUERE'LA (double querele or complaint), a process in ecclesiastical causes, in the nature of an appeal from the ordinary to his next immediate superior, as from a bishop to an archbishop, or from the archbishop to the king in council. [DELEGATES, COURT OF.] It seems to have been called double querele because in its form it is a complaint both against the judge and against the party at whose suit justice is delayed. (Burn, *Eccles. Law.*)

DUPLICATE RATIO (λόγος διπλασίων), a term used by Euclid, and defined as follows: If A be to B in the same proportion as B to C, then the ratio of A to C is called the duplicate ratio of A to B. When A, B, and C are lines, the duplicate ratio of A to B is that of the square on A to the square on B: when numbers, that of A times A to B times B. [RATIO, EXPONENT.]

DUPLICATION OF THE CUBE, the solution of the following problem: to find the side of a cube which shall be double that of another cube. This question, which is insoluble with perfect exactness by the methods of ordinary geometry, attained such a degree of notoriety among the Greek geometers that its origin was the subject of a mythologic fable. Eutocius, in his commentary on the sphere and cylinder of Archimedes, has preserved a letter of Eratosthenes to Ptolemy (Euergetes) in which it is said that one of the tragedians (Euripides, according to Valckenaer, cited by Montucla's editor) had introduced Minos erecting a sepulchre to Glaucus. The architect proposed one hundred palms every way, on which Minos declared that such a size would be too small for a royal sepulchre, and required that it should be doubled in size; and thereupon arose the difficulty. Eratosthenes also states another fable, namely, that the Delians, during a pestilence, had been ordered by the oracle to produce a cubical altar double of one which then existed. They applied to the school of Plato at Athens, who found that the problem eluded all their efforts. Other writers make mention of the latter story, and Valerius Maximus, in particular, adds that Plato referred the querists to Euclid; which must be an anachronism. However this may be, the problem continued to furnish an unceasing object of research; and such was the importance of its solution in the eyes of Eratosthenes, that he hung up his own solution in a temple as an offering, and composed an epigram, of which the principal value now is the proof which it affords that he considered Menæchmus as the first inventor of the conic sections.

Hippocrates of Chios (known as the first who could find the area of a curvilinear figure) perceived, according to Eratosthenes, that this problem could be solved as soon as two mean proportionals could be found between the side of the given cube and twice its length: that is, A being the length of the given cube, and X and Y two lines such that

$$A : X :: X . Y \text{ and } X : Y :: Y : 2 A,$$

this geometer saw that X was the side of the cube double of that on A. But the new problem presented exactly the same difficulty as before: various mechanical curves (as they were called) were invented for the purpose it was found that the conic sections were sufficient, but no solution appeared consistent with the restrictions implied in the postulates of Euclid.

Eutocius has mentioned the solution of Eudoxus, and has preserved those of Plato, Hero, Philo, Apollonius, Diocles, Pappus, Sporus, Menæchmus, Archytas, Eratosthenes, and Nicomedes. Pappus himself (in the third book, the first of those which remain entire) has preserved the solutions of Eratosthenes, Nicomedes, and Hero. In several instances these notices are the only clue which we have to the dates of the investigators, as there is strong presumption that those who are named by Eutocius and not by Pappus lived between the two.

The trisection of the angle [TRISECTION] offered difficulties of a similar kind, and engaged the attention of several of the individuals above mentioned. That of the quadrature of the circle is altogether of another kind. For the various solutions of the problem of the duplication, see Montucla, *Histoire des Recherches sur la Quadrature du Cercle*, 2nd edition, Paris, 1831; or Reimer, *Historia Problematis de Cubi Duplicatione*, Göttingen, 1798; or the works of Eutocius and Pappus already cited.

The importance of this problem declined with the rise of the decimal arithmetic. Many different attempts were made, some avowedly mechanical (as opposed to geometrical), others by those who imagined they could overcome the original difficulty. Any process for the solution was called *mesolabum* (a term as old as Vitruvius). One of the last was that of the celebrated Vieta, containing an error, which is the more remarkable, that little, if any, notice has ever been taken of it. (See his works, Schooten's edition, page 273.)

DUPUIS, THOMAS SAUNDERS, Mus. D., the composer of much good music for the chapels-royal, and a very distinguished organist, was born in London in 1733, and received his education in the royal chapel, of which he became organist and composer on the death of Dr. Boyce in 1779. In 1790 he was admitted to the degree of doctor in music by the university of Oxford, and died in 1796. After his death a selection from his works was published in two volumes, by his pupil, John Spencer, Esq., nephew and son-in-law of the late duke of Marlborough; but many of his best productions still continue in manuscript, and remain buried in the books of the king's chapel, among several other compositions of the most undisputed merit.

DUPUIS, CHARLES-FRANÇOIS, was born of poor parents, at Fryé-Château, between Gisors and Chaumont, on the 26th of October, 1742. His early instructions were due to his father, who, though in very humble circumstances, appears to have been a man of some learning and considerable intelligence; and the early turn of mind in young Dupuis was very decidedly to mathematics and astronomy. It was his good fortune to become known while yet a boy to the Duc de Rochefoucault, who procured him an exhibition to the college of Harcourt. His studies here took a new direction, and he made such rapid progress them as to secure the highest opinion of the professors the college, and give promise of distinction in future life.

Before the age of twenty-four, he was appointed professor of rhetoric in the college of Lisieux; and having sufficient leisure allowed him by his duties, he completed his course of law studies, and in 1770 was admitted an advocate of the parliament. Being directed by the rector of his university to pronounce the discourse on the distribution of the prizes, this led also to his being nominated to deliver the funeral oration, in the name of the university, on the queen Marie-Thérèse. With these his literary reputation commenced, and they are considered good specimens of purity and elegance in Latin composition.

The nature of his literary pursuits again led him into contact with the subjects of his early study; and profiting by the lessons and the friendship of Lalande, he entered upon the study of astronomical history with a zeal which never abated to the close of his life. His attention was especially directed in the first place to the probable signification of the astronomical symbols which constituted the signs of the zodiac; and thence to all the other antient constellations. His active mind, however, even in the midst of these deeply interesting speculations, was alive to other objects and among his amusements was the construction of a telegraph, founded on the suggestions of Amontons, by means of which, from 1778 to the commencement of the Revolution, he carried on a correspondence with his friend M. Fortin, who was resident at Bagneux, he himself being located at Belleville. This mode of correspondence he however very prudently laid aside, lest it should lay him open to suspicion from the factions that then governed France.

In 1777 and 1778 he published in the 'Journal des Savans' the first sketches of the theory at which he had arrived; and shortly after, both in the astronomy of his friend Lalande, and in a separate 4to. volume under the title of 'Mémoire sur l'Origine des Constellations et sur l'explication de la Fable par l'Astronomie,' 1781. The sceptical tendency of the views entertained by Dupuis led Condorcet to recommend him to Frederick the Great, as professor of literature in the College of Berlin, and successor to Thiébault; and the offer was accepted by Dupuis. The death of Frederick, however, prevented the arrangement from being carried into effect; but the chair of Latin eloquence in the College of France becoming then vacant by the death of Bejot, he was appointed to fill it. In the same year (1778) he was named a member of the Academy of Inscriptions, and was appointed one of the four commissioners of public instruction for the department of Paris. The danger of his residence in the capital now induced him to seek a retreat at Evreux. He was, notwithstanding his retirement, named member of the Convention for the department of Seine-et-Oise; and was remarkable for the moderation of his views. Caution was the characteristic of his political career. In the year II. he was elected secretary of the Assembly; and in the following year a member of the Council of Five Hundred. He was elected one of the forty-eight members of the French Institute though after much determined and discreditable opposition from the ultra-revolution party. On the 18th Brumaire year IV., he was elected by the department of Seine-et-Oise their member of the legislative body, and soon after president of that assembly, and ultimately was nominated a candidate for the senate. Hopeless of the regeneration of France, he retired at once from public life, and devoted the remainder of his days to the investigations of the questions which arose out of his early speculations. We have hence to trace his progress only as a man of letters and a man of science and to give some general idea of the views which are contained in his several works.

On the publication of the 'Mémoire sur les Constellations,' a new course of erudite inquiry was opened; and though its arguments and conclusions were contested by Bailly, he gave Dupuis full credit for the ability and learning displayed in the work. He afterwards renewed his researches, and made them the subject of a course of lectures delivered from [illegible] chair in the college of Lisieux. In 1794 he published his great work entitled 'Origine de tous les Cultes, ou la Religion Universelle,' 3 vols. 4to. with an Atlas; and a [illegible] slightly abridged in one of its parts (the 'Justification'), [illegible] 12 vols. 8vo. This work gave rise to much discussion, often conducted with a sectarian bitterness little creditable to philosophical or theological investigation. In 1798 he published an abridgment of the 'Origine' in one vol. [illegible] rather a series of extracts from his large work, under [illegible] same title; but a much more methodical abridgment was shortly after given to the world by Destutt-de-Tracy.

The wildly-displayed hatred towards Christianity which so strongly developed itself during the eventful period of the French revolution was well calculated to create deep interest in the work of Dupuis. He had been led to conclude that the earliest traces of the general mythology of the southern climates would be found in Upper Egypt, if indeed they had not their origin there. In this celebrated work, therefore, originated the 'Commission' to explore the ruins of that country, which was undertaken by Napoleon after his return from Italy. Nothing indeed can show so clearly the influence which this work had exercised over the 'regenerated nation,' as that the most ambitious of all the men of his time should leave the scene of the most glittering hopes to a daring spirit like his, to lead an expedition such as this. Out of that expedition what new and unexpected results have arisen! The very phraseology of history has been changed; and the sacred rites and domestic manners of antient Egypt are now scarcely, if at all, less understood than those of Greece and Rome.

The Zodiac of Tentyra (or Denderah) engaged much of the attention of Dupuis, upon which he published a *mémoire* and an *explication*, in the 'Revue Philosophique' for May 1806, which he afterwards published in an enlarged and separate form in one volume 4to, under the title of 'Mémoire explicatif du Zodiaque Chronologique et Mythologique.' In this curious dissertation he compares the Greek and Egyptian Zodiacs with those of the Chinese, the Persians, the Arabs, and all the others of which he could obtain any distinct notices. He afterwards read to his class of the Institute a 'Mémoire sur le Phénix,' which, as he contended, signified the reproduction of the cycle of 1461 common (vague) Egyptian years. In the 'Nouvel Almanach des Muses' for 1805 he also published a fragment of the poem of Nonnius; it is indeed said that his astronomical system was suggested by this poem originally, and it is certain that his 'Origine des Cultes' is but a voluminous commentary on the ideas contained in that poem.

Dupuis died at Is-sur-Tille, on September 29, 1809, aged 67. He was a member of the Legion of Honour. He was a man of strict probity, and much esteemed by his friends for his personal qualities. He amassed no fortune, being satisfied to expend his income upon the materials for his researches.

He left in MS. a work on cosmogonies and theogonies, intended as a defence and illustration of the doctrines of the *Origine des Cultes*. In this work Leblond considered that Dupuis had at last discovered the interpretation of the Egyptian hieroglyphics—a conclusion that few, since the researches of Dr. Young and Champollion, will feel disposed to admit, even though they may not adopt the views of Champollion to any great extent. There is also reason to believe that it was in consequence of conversations with Dupuis that Volney composed his celebrated work on the Ruins of Empires.

Dupuis has been often stigmatized as a paradoxical writer. Bold and speculative he was, but there is certainly little cause to call him paradoxical. His conjectures are often plausible, though his deductions from them are frequently inconsequential. Whatever might have been the immediate effect of his scepticism, there can be little doubt that the ultimate effect has been alike favourable to early history and to the Christian religion. He was a sincere and candid man, and always appeared to be fully impressed with the truth of the conclusions at which he had arrived. It was indeed that earnestness of character that gave so much weight to his opinions and so much influence to his suggestions. Had this feature been wanting in the character of Dupuis, the expedition to Egypt had never been undertaken, nor, consequently, would the brilliant discoveries to which it finally led have been made.

DURA MATER. [Brain.]

DURA'MEN, the name given by physiologists to the central wood or heart-wood in the trunk of an exogenous tree. It is the oldest part of the wood, and is filled by the secretions of the tree, so that fluid can no longer ascend through its tubes, which are choked up by the deposition of solid matter; otherwise it is of the same nature as the alburnum. It is only where plants form solid hard secretions that heart-wood is distinguishable from sap-wood: in the poplar, willow, lime, &c., no secretions of this kind are formed; the two parts of the wood are both nearly alike, and consequently the timber of such trees is uniformly perishable. Ship carpenters call the duramen the spine: it is always distinguishable from sap-wood by its deeper colour, and sometimes, as in the yew, the sandarach, and certain kinds of deal, the limits of the two are clearly defined. But in most cases the heart-wood and sap-wood gradually pass into each other, so that no certain line can be drawn between them.

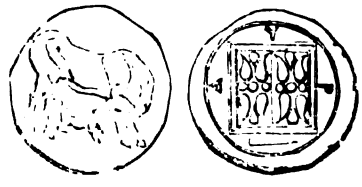
DURANCE, a river in the south of France, belonging to the basin of the Rhône. The source of the Durance is marked in the maps near Briançon; but the sources of the Guisane and the Claret, which flow from the ridge of the Alps that separates the department of Hautes Alpes from Savoy, have each a better title to be considered the true head of the Durance. These streams unite at Briançon, about 20 miles from their respective sources, and just after their junction receive the Servières, another small stream. From Briançon the Durance flows south-south-west above 25 miles to Embrun, receiving by the way the Gyronde (which receives the Gy and the Boude) and the Guil (which receives the Aigue-blanche, the Melesen, and the Rioubo), and several small mountain streams, as the Crevoux, the Vachere, &c. The Ubaye, from Barcelonette (which receives the Ubayete, and the Bachelard), joins the Durance 10 miles below Embrun. From the junction of the Ubaye the Durance flows first south-west, then south, and then west by north 135 miles, into the Rhône below Avignon, receiving a great number of tributaries, of which the principal are the Buech (which joins it at Sisteron), the united streams of the Bes and the Bleone from Digne, the Asse, the Verdon from Castellane, and the Calavon from Apt. In the lower part of its course the bed of the Durance is full of islands. The stream is very rapid, and its inundations frequent. It is not navigable, but is used for floating timber. Many of its tributaries are used for floating. It was known to the Romans by the name Druentia.

DURANGO, a town in the Mexican United States, the capital of the state of the same name, is situated in about 24° 28′ N. lat. and near 105° W. long. in a wide plain, 6848 feet above the sea, and at no great distance from the Sierra Madre, which rises to the west of the town. Its population amounts to upwards of 22,000 souls, and it carries on a considerable commerce in the agricultural produce of the country lying about it, and in that of the numerous and rich mines, partly situated in the Sierra Madre and partly east of the town. Iron ore is found within a quarter of a league from the town, but the attempts to turn it to advantage have, so far as we know, not succeeded to any extent. Not far from Durango is the Breña, a tract more than 30 miles in length and about half that width, which is occupied by hills composed of basalt and covered with scoria; among them is a crater of considerable dimensions. (Humboldt; Ward.)

DURANTE, FRANCESCO, a celebrated Italian composer, was born in Naples, in 1693, and educated under Alessandro Scarlatti. His works are not numerous, and chiefly of the sacred kind. The duets, on which his reputation now mainly rests, are, Dr. Burney states, the cantatas of his master, arranged for two voices! Hence the fame of this much-vaunted composer will hereafter depend on that of his disciples, Pergolesi, Piccini, Sacchini, Paisiello, &c., who received instructions from him at the Neapolitan Conservatorios of *St. Onofrio*, and the *Poveri di Gesu Cristo*, of both of which Durante was the principal.

DURA'ZZO, DURA'S, the antient Epidamnus, afterwards called Dyrrachium, is a town on the coast of Albania, in 41° 22′ N. lat., and 19° 27′ E. long., situated on the south coast of a peninsula which projects into the Adriatic, and forms the south boundary of the gulf of Drin. Epidamnus was a colony of Corcyra [Colony], but it afterwards changed its name into Dyrrachium. It fell under the Romans at the time of the conquest of Macedonia, and its harbour became the principal means of communication between Italy and the north parts of Greece, Macedonia, and Thrace. The Romans embarking at Brundisium, which is nearly opposite, landed at Dyrrachium, and thence by the Via Egnatia they reached Thessalonica, on the Ægean sea. Pompey defended Dyrrachium with success against Cæsar before the battle of Pharsalia. After the fall of the Roman empire Dyrrachium came successively into the hands of the Goths, Bulgarians, and the Normans from Sicily, who made it their stronghold in their wars with the Byzantine emperors. It afterwards fell into the hands of the Venetians, from whom it was taken by sultan Bayazid II. Durazzo is now included in the pachalik of Skutari, near the borders of that of Berat. It carries on some trade by sea, and exports the surplus corn which grows abundantly in the neighbouring plains. Its population is reckoned at between 4000 and 5000, and it has a Greek bishop. It is a place little visited by travellers: the scanty remains of Apollonia, which are two short days' journey to the south of it, near the banks of the Apsus, have been described by Colonel Leake and Dr. Holland. (Leake's *Travels through Northern Greece.*) Leake was prevented by illness from proceeding to Durazzo.

John, the eighth son of Charles II. of Anjou, king of Naples, assumed, with the consent of the Byzantine emperor, the title of duke of Durazzo and lord of Albania; and from him sprung the Durazzo branch of the Anjous, who reigned a while over Naples and Hungary. Charles III., king of Naples, was a grandson of John; he died in Hungary, and left two children, Ladislaus and Joanna, who reigned in succession at Naples, but died both without issue.



Coin of Dyrrachium.
British Museum. Actual size. Silver. Weight, 469 grains.

DÜREN, a minor circle of the administrative circle of Achen (Aix la Chapelle), in the Prussian province of the Rhine. Its area is about 215 square miles, and it contains 1 town, 1 market village, 106 villages, and 16 hamlets, with a population of about 46,600 (1816, 37,186). The Roer traverses it from south to north-west: it is hilly in parts, and has about 128,000 acres of arable land, 18,330 of meadows and pastures, and 51,700 of woods and forests. It produces much grain and fruit, rears cattle, contains iron, lead, alum, and coal mines, and manufactures woollens, ironware, paper, vegetable oil, &c.

DÜREN, the chief town, called by the Romans Marcodurum, whence its former name of Mark-Düren, lies near the banks of the Roer, 50° 46′ N. lat., and 6° 36′ E. long. It is a walled town, the seat of a public mining-direction, possesses a Roman Catholic gymnasium or high school, three nunneries, five Catholic and two Protestant churches, and a synagogue, and contains about 6800 inhabitants: in 1818 their numbers were 4909; and in 1825, 5610. Düren has considerable manufactures of fine and ordinary woollen cloths, stuffs, and coverlids, which employ between 1200 and 1300 hands, as well as of screws and nails. There are also manufactures of iron and steel ware, paper, coarse cottons, soap, leather, oil, trinkets, &c. It has an extensive trade in grain, a horse market, and three large fairs in the course of the year. On this spot several cohorts of the Ubii, who had assumed the Roman name of Agrippinenses, were surprized and cut to pieces by Civilis, the Batavian leader, in the year 70 A.D. (Tacit. *Hist.* iv. 28.)

DÜRER, ALBRECHT, or ALBERT, born at Nürnberg the 20th of May, 1441, was the son of a skilful goldsmith, and received that sound education which the wealthy burghers of the free towns of Germany were accustomed to give to their children. In all branches of instruction Albrecht made great progress, and showed also much ingenuity in the profession for which he was intended; but his genius being bent towards a nobler art, he gave up at once, to the great vexation of his father, the working of gold, and placed himself under the most able painter of his native country, Michael Wohlgemuth (1486). After finishing his apprenticeship he set out on his travels, and in 1490 went through Germany. On his journey he painted portraits and other pictures which were highly admired. Improved by experience and with increased reputation, he returned home in 1494, and soon after executed his master-piece, a drawing of Orpheus. It was the custom of those times for a painter, in order to be received and acknowledged as a master, to exhibit a piece which merited the approbation of his teacher and of the other masters of his craft. When this complished, the candidate received a kind of diploma, s entitled to the honours and rights of a master.

After obtaining the mastership Dürer visited Holland and Italy, where he executed some of his best pictures, such as the Martyrdom of St. Bartholomew for the church of St. Mark, and Adam and Eve for the German church in Venice, which was afterwards bought for the Gallery of Prague. In Bologna he became acquainted with Raphael, who esteemed him highly. In token of their friendship, each presented the other with his portrait. He returned home in 1507, with the reputation of being the first painter of his country.

'Certainly,' says Vasari (Vite de' Pittori), 'if this diligent, industrious, universal man had been a native of Tuscany, and if he could have studied as we have done in Rome, he would have been the best painter in *our* country, as he was the most celebrated that Germany ever had.'

His productions were so highly valued as to attract the notice of the most powerful sovereigns of his time, Maximilian the First and Charles the Fifth, who appointed him their painter, and bestowed upon him riches and honours.

To please his father Dürer had married, against his inclination, the daughter of a wealthy neighbour: but the match turned out so unfortunate that it embittered his life, and his countrymen attributed his premature death to his domestic misfortune. It is said that his wife was not deficient in personal attractions, but peevish and jealous to the utmost degree. He died broken-hearted in 1528, in the 58th year of his age. The senate of Nürnberg, to honour the memory of their illustrious citizen, decreed him a public funeral, which was celebrated with great pomp and solemnity. This circumstance has led some of his biographers to suppose that Dürer died in poverty, which however was not the case. In spite of his liberality, he left a tolerably good fortune to his surviving Xantippe.

Dürer's paintings are admired for the vivid and fertile imagination, the sublime conception, and the wonderful union of boldness and correctness of design which they display. He was the first man in Germany who taught the rules of perspective and the proportions of the human body according to mathematical and anatomical principles. In fact, his works were in this respect so classical, that even his prints and wood-cuts were purchased by the Italian painters for their improvement in those branches.

Some critics have found fault with the unnecessary correctness of drawing and the exuberance of his imagination; but the only fault that can be really objected to him is his total neglect of costume. Yet this fault is more conventional than real. His pictures, in spite of this violation of the rules of taste, produce lasting impressions of the sublime and beautiful; and impartial judges must always honour in him the greatest master of the German school.

Besides his great historical paintings, the best of which are in the collections of Vienna, Prague, Munich, and Dresden, Dürer has left some landscapes that are highly valued. Some of his paintings were in England in the collection of Lord Arundel. Dürer was also an excellent engraver in copper and wood; his woodcuts are masterpieces of the art, and considered equal to those of Hugo da Carpi.

The best among his woodcuts, both in respect of invention and execution, are his greater Passion and his Revelation of St. John. So much were they sought after, even during his lifetime, that a Venetian artist was induced to counterfeit them. When Dürer heard of this forgery, he went to Venice, and commenced a suit against the man, whose name was Marc Antonio Franci. The senate of Venice would have punished the offender severely, if Dürer had not obtained his pardon. There is a volume containing more than 200 original drawings by Albert Dürer in the print-room of the British Museum, which formerly belonged to the collection of Sir Hans Sloane, and was probably part of the celebrated collection of Dürer's friend W. Pirkhaimer. In the same room is preserved an exquisite carving by him in hone-stone, of the Birth of St. John, bequeathed to the Museum by Mr. R. P. Knight, who had purchased it at the price of 500*l*. It is dated 1510.

An extensive collection of Albert Dürer's engravings was bequeathed to the British Museum by the late Mr. Nollekens.

Dürer's portraits were also highly esteemed: it was said of him that he not only possessed the talent of catching the exact expression of the features, but also of delineating the different characters and passions.

Two inventions are attributed to him; that of printing woodcuts in two colours, and that of etching. Some, however, dispute his claim to the invention of the art of etching, though it is not denied that he was the first who excelled in it.

In his private life he was amiable, upright, and benevolent. He was a strong supporter of the Protestant religion, without making any pretensions to superior piety.

Dürer wrote several valuable works on geometry, perspective, and fortification. He bestowed such labour on the purity of his native tongue, that his writings even now are well worth the study of the German scholar.

While the French corruption of taste was exercising a baneful influence over the fine arts, Dürer was looked upon as a barbarian; but opinion is now changed, and the modern school of German painters and critics view him as one of their great masters, and as a model by following which the art of painting may be brought back to its former dignity.

His life has been written by Arend and Roth, and lately by Heller, who has given the most critical and complete catalogue of all his works. Goëthe, Tieck, Wackenrode, and other distinguished writers have vindicated his claims.

D'URFEY, THOMAS, was born in Devonshire, but the exact time of his birth is uncertain. He was designed for the law, but quitted that profession for poetry. His dramas had remarkable success in the days of Charles II., but were soon afterwards banished from the stage on account of their outrageous indecency, and at present scarcely their names are known, except to the students of English dramatic history. Much of his fame was owing to his songs and satirical odes, which he is said to have himself sung in a lively and agreeable manner. He is represented in the 'Guardian' as being on such terms of intimacy with Charles II., that the king would sometimes lean on his shoulder and hum tunes with him: he was also a favourite at most convivial parties, and was so much celebrated for his qualities as a good companion, that it was considered a kind of honour to have been in his company. He was reduced to great distress in the latter part of his life, and applied to the managers of the theatre, who performed for his benefit one of his comedies. The profits which were acquired seem to have been sufficient to render his last days comparatively easy, if any judgment is to be founded on his poems of this period, which are written with liveliness. He died in 1723, and was buried at St. James's, Westminster.

A collection of D'Urfey's poems, entitled 'Pills to purge Melancholy,' is extremely rare, and sells for a high price. It is much esteemed by those bibliographers who think licentious works valuable if they are but scarce.

DURHAM, an English county, consisting of the main part, between the rivers Tyne and Tees, and of three detached portions, which are separated from the main portion by the intervening county of Northumberland, or by that of York. 1. The main portion is bounded on the north and north-west by Northumberland, from which it is for the most part separated by the river Tyne and its tributaries, the Stanley Burn and the river Derwent; on the west it is bounded by Cumberland and Westmoreland, from the former of which it is partly separated by the Crook Burn, a feeder of the Tees, and from the latter by the Tees itself; on the south it is bounded by Yorkshire, from which it is separated throughout by the river Tees; and on the east it is bounded by the German Ocean. Its greatest length is from east to west, from Seaton Snook, a headland at the mouth of the Tees, to the junction of the Crook Burn and the Tees, on the boundary of the three counties of Cumberland, Westmoreland, and Durham, 48 miles; its greatest breadth, at right angles to the length, is from the fort at the mouth of the Tyne, at South Shields, to Stockburn, or Sockburn, on the Tees, 39 miles. 2. The principal detached part, consisting of Norhamshire and Islandshire, which latter includes Holy Island and the Farne Isles, is bounded on the north by Berwick bounds, from which it is separated by the Tweed; on the north-west and west by Berwickshire in Scotland, from which also it is separated by the Tweed; on the south by Northumberland, and on the east and north-east by the German Ocean. The form of this portion of the county approaches that of a triangle, of which one side faces the north and north-west, and is nearly 11 miles long in a straight line; another, the north-east, and is 14 miles long in a straight line; and the third, the south, and is 17 miles long in a straight line. 3. The second detached portion, comprehending the parish of Bedlington, sometimes called Bedlingtonshire, is bounded on the north, west, and south by Northumberland, from which it is separated on the north by the river Wensbeck, on the south by the river Blyth, and on the east by the German Ocean. It is 7 miles long from east to west, and 4½ miles broad from north to south. 4. The third detached portion, the parish of Craike, is near Easingwould, in Yorkshire, and is surrounded by that county: it is 3 miles long from north to south, and about 2½ miles broad. The areas of the several portions, as found by taking the areas of the several parishes, are as follows:—

	Statute Acres.
Main portion	621,690
Norhamshire and Islandshire .	45,630
Bedlington parish . . .	8,910
Craike parish	3,300
	679,530

The area of the whole is about 1097 square miles. The population in 1831 was 253,910, giving 231 to a square mile in size and in absolute and relative population Durham is below the average of the English counties. Durham, the capital of the county, is on the Wear, 235 miles in a straight line north by west of London; 259 miles by the road through Baldock, Stamford, Doncaster, Boroughbridge, and Bishop Auckland; or by that through Boroughbridge, Northallerton, and Darlington; or 263 miles by the road used by the Thurso, Edinburgh, and York mail, through Ware, Huntingdon, Stamford, Doncaster, York, Easingwould, Thirsk, Northallerton, and Darlington. The main portion of the county is comprehended between 54° 27′ and 55° 1′ N. latitude, and 1° 8′ and 2° 21′ of W. longitude.

Coast, Islands, &c.—The coast of the county of Durham is for the most part low, especially in the detached portions of the county. Islandshire has no cliffs, neither has Bedlingtonshire. From Islandshire sand banks (Fenham flats) run out and connect Holy Island with the main land, so as to render the island accessible at low water to vehicles of all kinds; though the sands are dangerous to persons not acquainted with them. In the main portion of the county there are several ranges of cliffs, as at Suter Point, between the Tyne and the Wear; along the coast from the Wear southward to Hawthorn Dean; again along the coast for three miles south from Horden Point, at the headland on which Hartlepool stands; and again at Seaton Bents. All these cliffs are of magnesian limestone, except those at Seaton Bents, which are formed by rocks of the red marl or new red sandstone formation.

Holy Island is of an irregular form, nearly 4 miles long from east by south to west by north, and nearly 2 broad from north to south. It contains 3320 acres, and had in 1831 a population of 836 persons. This island was called by the Britons Inis Medicante, and was afterwards known by the name of Lindisfarne: its name of Holy Island was given to it from its having been the residence of several of the fathers of the Saxon church. It was anciently the seat of a bishoprick, and had a monastery under the government of the bishops, which was subsequently reduced to be a cell of the Benedictine monastery of Durham. The church of the monastery is now in ruins. The soil of the island is rich, but before the inclosure of the common in 1792 there were only forty acres under tillage, and that portion was subject to intercommonage as soon as the crops were reaped. There is a small village or town on the west side, formerly much more extensive: the inhabitants are chiefly engaged in fishing. There is a small harbour and an old castle, which during the last war was occupied by a garrison sent from Berwick. This castle is upon a lofty rock of whinstone, in the south-east corner of the isle. On the north-east side of the island is a projecting tongue of land a mile long, and in some parts only sixty yards broad, occupied by rabbits; on one side of this tongue the tide may be seen ebbing while it is flowing on the other.

The Farne Islands lie to the south-east of Holy Island. The group consists of several small islets or rocks, some of which are visible only at low water. They produce kelp, and some of them a little grass. There are two lighthouses on two islets of the group.

Surface, Hydrography, Communications.—Durham may be characterized as a hilly county. The western part is overspread by the branches of the great Penine Chain, from the eastern slope of which the chief rivers of the county flow. The two principal branches of this chain, which belong to Durham, are separated from each other by Weardale, the valley of the Wear; from the Yorkshire hills by Teesdale, or Teasdale, the valley of the Tees; and from those of Northumberland by the valley in which the Derwent, a feeder of the Tyne, flows. Large portions of the mountain district consist of moor-lands covered with heath, or, as it is here termed, 'ling.' The hills north of Weardale have the name of Weardale Forest, and those north of Teasdale are called Teasdale Forest; but they are bare of wood.

The principal elevations in the county are Kilhope Law (2196 ft.), Cross Ridge, Bolts Law, Baron Hope, Collier Law (1678 ft.), and Fatherly Fell, in Weardale Forest; Pike Law, West Pike, Manner Gill Fells, and Eglestone Bank, in Teasdale Forest; Pontop Pike, on Lanchester Common, south-east of the valley of the Derwent (1018 ft.); Down Hill, Lizard, Fulwell Hill, and Boldon Hill, near the sea, between the Tyne and the Wear; Maiden's Paps, Warden Law, or Wordeslow (632 ft.), Low Hills, Hare Hill, and Hartmoor, near the sea, between the Wear and Hartlepool; Wheatley Hill, north-east of Durham; and Brandon Mount, south-west of the same city, but on the north side of the valley of the Wear (875 ft.)

The moors are chiefly occupied as pasturage for sheep of the black-faced or heath kind, and for a few young cattle and horses. The best wooded part of the county is the vale of Derwent, which is especially adapted to the growth of oak; but it produces also ash, elm, birch, and alder, and a quantity of underwood, especially hazels.

The chief rivers are the Tyne, the Wear, and the Tees, with their tributaries. The Tyne drains the northern parts, the Wear the middle, and the Tees the southern.

The Tyne [NORTHUMBERLAND] forms the northern boundary of the county for about 18 miles, from the junction of the Stanley Burn at Wylam to the sea, and its navigation extends from above Newcastle to the sea, a distance of about 15 miles. Its Durham affluents are the Derwent and Team rivers and the Stanley and Hedworth Burns.

The Derwent rises in Northumberland, and flowing east, reaches, about 3 miles from its source, the border of Durham, along which it flows, first east and then north-east, then south-east, and then north-east again for 16 or 17 miles, receiving on its right (or Durham) bank the Nuckton, Boltshope, Baronhope, Hysop, and Herselop Burns, or Becks (*i. e.* small streams; the last two unite before entering the Derwent); and on its left (or Northumberland) bank many others. At the junction of the Milk or Milch Burn it leaves the border (which here turns off to the north), and flows through the county for about 9 miles north-east, till it again meets the border, and falls into the Tyne 3 miles above Newcastle. Its whole course is 28 to 30 miles.

The river Team rises on the side of Pontop Pike, and flows first east-by-north and then north-by-west about 13 miles into the Tyne, about a mile above Newcastle. The Stanley Burn and the Hedworth Burn are only four or five miles long.

The Wear rises near Kilhope Law, and flows east and south-east above 4 miles to Burtree or Bowertree Ford. In this part of its course it is known as the Kilhope Burn, and is joined by the Welhope and Burnhope, and some other burns. From Bowertree Ford the Wear flows east-by-south 18 miles to the junction of the Bedburn river, passing the towns of Stanhope and Wolsingham, and receiving on the right bank the Irshope, Harthope, Dadree, Swinhope, Westenhope, Snowhope, and Bollihope Burns (the last of which receives the Harehope); and on the left bank the Middlehope, Rookhope, Stanhope, Shittlehope, Wescrow, Houslip, and Eals Burns, all of which are small. The Wescrow receives the Tunstall and the Thornhope. The Bedburn river is formed by the junction of the Euden and Sharnberry Becks, and subsequently of the North Grain Beck, and another to which the maps give no name. This upper part of the course of the Wear is through the wild and romantic district of Weardale, bounded on each side by high hills. From the junction of the Bedburn the Wear flows still east-by-south 6 miles to Bishop Auckland. In its way it is joined on the right by the Lin Burn, on the left by the Bitch Burn, and at Bishop Auckland by the Gaunless, which rises on Eglestone Common, and has a course of 15 miles. The Gaunless, near its source, is called the Hyndon Beck: it is joined in its course by the Humber Beck. From Bishop Auckland the Wear turns to the north-east, and flows in a very winding course about 36 or 37 miles past Durham and Chester-le-Street into the German Ocean at Sunderland. Between Bishop Auckland and Durham it receives the Croxdale Beck and the Shinkly's river on the right bank, and the Stockley Beck and the Browney river on the left. The Browney river is the largest of these; it rises on Satley Common, and flows first east and then south-by-east 17 miles, receiving the Pan, the Smallhope, and the Derness (which is joined by the Hedley) Becks. Below Durham the Wear receives the Stanley Burn, united with the Cock Burn on the left bank, and the Lumley Burn on the right bank, all at or near Chester-le-Street. The whole course of the Wear may be estimated at about 65 miles, for about 18 or 20 of which, viz. up to the city of Durham, it is navigable. It is crossed at Sunderland, near its mouth, by an iron bridge of one arch, of 236 feet span and 100 feet above high water-mark. The importance of its navigation arises from the export of coals from the neighbouring mines, for the produce of which it furnishes an outlet. London and many towns upon the Thames and on the eastern coast receive a considerable portion of their supply of coals from the Wear.

The Tees rises in Cumberland, on the slope of Cross Fell (2901 feet high), and for the first few miles of its course forms the boundary between Cumberland and Westmoreland. It is joined by the Trout and Crook Becks, and upon its junction with the latter forms the boundary of the county of Durham, separating it for a very few miles from Westmoreland, and throughout the remainder of its course from Yorkshire. The general direction of the Tees till it reaches Sockburn, nearly 55 miles from its source, is east-south-east; from thence it flows nearly 30 miles north-east into the German ocean, its total course being between 80 and 90 miles. The first part of the course of the Tees to Barnard Castle is pretty direct; it flows through a narrow valley in a hilly country, and is swelled on the right or Westmoreland and Yorkshire bank by several becks, or small rivers, of which the chief are the Maize or Marys, the Lune, and the Balder or Baulder: on the left or Durham bank it receives the Harwood joined with the Langdon Beck, the Ettersgill, the Bowles, the Hadshope or Hudshope, the Eglestone, and one or two others. The valleys watered by these several affluents of the Tees open laterally into the valley of the Tees, and are many of them remarkable for picturesque beauty. A ridge of trap rocks across which the river flows at Caldron Snout, at the junction of the Maize or Marys Beck, forms a series of falls in a distance of 596 yards which offer a fine contrast to the still water of The Wheel, a pool or lake into which the river expands just above. At High Force, or Mickle Force, a few miles lower down, another ridge of coarse-grained grey columnar basalt crosses the river, and causes another fall of 56 feet. A few miles below this fall and three above the village of Middleton in Teasdale, basaltic rocks form the bank of the river, and serve to support Winch Bridge, which consists of a plank two feet wide, with low handrails, suspended by iron chains across the river, here 63 feet wide, at an elevation of 56 feet above the water. Below Barnard Castle the course of the river is still tolerably direct till it reaches the neighbourhood of Darlington. It receives in this part of its course, on the right bank, the Greta from Yorkshire, and on its left bank, the Grand River, or Staindrop Beck, 10 or 12 miles long, which flows through Raby Park and past the town of Staindrop, receiving the Forth or Sut Beck. From the neighbourhood of Darlington the channel winds very much. At Croft near Darlington it receives a considerable stream on its right bank, and on the left the river Skerne, which, rising between Durham and Hartlepool, has a very winding course to the south-south-west, of more than 25 miles, receiving several streams by the way, and passing the town of Darlington just before its junction with the Tees. The Tees does not receive any considerable affluent after the Skerne, except the Leven from Yorkshire. It passes the town of Stockton, below which it receives the Hartburn and Billingham Becks, and at Greatham Fleet, near its mouth, the Elmeldon Beck united with another from Greatham. The wide æstuary of the Tees is navigable for colliers and other large vessels up to Stockton, and for small craft several miles higher up, above Yarm in Yorkshire: the navigation has been shortened by a cut, by which a considerable bend in the river is avoided.

There are several small streams which flow into the sea between the Wear and the Tees. They are called Deans as Ryhope Dean, Seaham Dean, Dalton Dean, Hawthorn Dean, Castle Eden Dean, and Hasledon Dean.

The river navigation of Durham, comprehending only the lower waters of the Wear and of the border rivers Tyne and Tees, is confined to the eastern side of the county. There are no canals or artificial cuts, except one, already noticed, made to shorten the winding course of the Tees.

The mail-road to Edinburgh, Aberdeen, Inverness, and the north of Scotland, crosses this county from south into north. It enters it at Croft Bridge over the Tees, and passes through Darlington, 241 miles from town, Durham (259 miles), Chester-le-Street (265 miles), and Gateshead (272 miles), where it quits the county, crossing the Tyne to Northumberland. There are two other roads from London to Durham city: they branch off from the Glasgow and Carlisle mail-road at Scotch Corner in Yorkshire, and enter the county by Pierce Bridge over the Tees (239 miles from London). Here they divide, the right-hand road passing through the villages of Heighington and Eldon, and the left-hand road through Bishop Auckland (248¼ miles from London). They reunite a few miles beyond Bishop Auckland and fall in with the Edinburgh mail-road near Sunderland Bridge, over the Wear, about four miles before reaching Durham (259 miles).

The road from London to Sunderland branches off from the Edinburgh mail-road at Thirsk in Yorkshire, and proceeding by Yarm, upon leaving that town crosses the Tees into the county of Durham, and proceeds forward to Stockton (241¾ miles from London), and from thence to Sunderland, 268¼ miles. At Bishop Wearmouth, which is a suburb of Sunderland, where the road turns off to enter that town, a branch proceeding forward runs to South Shields at the mouth of the Tyne (275 miles). From this branch road another branch to the left leads to Gateshead, forming a communication (13 miles) between Sunderland and Newcastle.

From Durham roads lead to Sunderland (distant 13 miles), through Bishop Wearmouth; and by Bishop Auckland (distant 10 miles), and Staindrop (19 miles), to Barnard Castle (24 miles). From Barnard Castle (245 or 246 miles from London) a road leads along the valley of the Tees, by Middleton in Teasdale (distant 9¼ miles) to Aldstone Moor in Cumberland; and from Darlington, one by West Auckland (distant 9 miles), Wolsingham (20 miles), and Stanhope (26 miles), along the valley of the Wear to the same town. From Wolsingham a road runs northward to Hexham in Northumberland and another to Gateshead. From Gateshead a road runs along the south side of the Tyne valley to Hexham. Other roads do not require notice.

Durham has numerous rail-roads, most of which have been constructed by the coal owners for the conveyance of coals from the pits to the rivers Tyne and Wear, where they are shipped. Acts of parliament have been obtained for two more extensive rail-ways; one, the Stockton and Darlington, extending from Wilton Park colliery, west of Bishop Auckland, by a circuitous line past Darlington to Stockton, and from thence across the Tees by a suspension bridge, and by the side of the navigable cut made in the Tees to Middlesburgh and Cleveland Port on that river; with various branches: the other, the Clarence rail-road, from the Stockton and Darlington rail-road, a few miles north of Darlington, by a more direct course to the northern bank of the Tees below Stockton, with a branch to the city of Durham, and some subordinate branches. The various acts for the Stockton and Darlington rail-road were obtained in 1821-1828; those for the Clarence rail-road in 1828-1829. The estimated length of the former, including its branches, is about 38 miles; of the latter, nearly 46.

Geological character.—The lower part of the valley of the Tees, from the junction of the Skerne, and the coast from the mouth of the Tees to Hartlepool, are occupied by the red marl or new red sandstone, the uppermost of the formations which are found in the county. Among the strata of the formation a fine-grained sandstone of a brick-red colour predominates. Some attempts have been made to find coal by boring through the red marl, but without success, though the pits were sunk to the depth of more than 700 feet. At Dinsdale, near Croft Bridge, where one of these attempts was made, the strata were found to be numerous, and to consist, as far as could be judged from the miners' language, of white, grey or red sandstone, with occasional partings of a more compact nature, red or blue shale, coaly matter in thin layers, and gypsum in nodules or in beds, which in one case were three feet thick: the lowest bed in the two deepest workings was found to be a strong white rock of a calcareous nature. Sulphureted springs are found in this strata: one of them arose from a perforation made in boring for coal. (Mr. Winch, *Geol. Trans.*) The newer magnesian or conglomerate limestone crops out from beneath the north-western limit of the red marl: it extends along the coast to the mouth of the Tyne, and along the valley of the Tees to the junction of Staindrop Beck with the Tees, between Darlington and Barnard Castle: its inland boundary is a line drawn southward from the mouth of the Tyne, gradually diverging from the coast-line to the village of Coxhoe, between Durham and Stockton; and from thence south-west to the Tees. This limestone forms a range of round-topped hills along the coast, of small elevation, the highest (Painshaw, near the Wear) being estimated at only 400 feet. The upper stratum of the limestone here is a species of breccia, with which wide chasms or interruptions in the cliff are filled: the next strata are thin and slaty, of a white colour inclining to buff; but lower down the stratification becomes indistinct, the rock is of a crystalline and cellular texture, and of a light-brown colour. The brown variety is quarried near Sunderland: it partakes of the nature of limestone, and from containing some inflammable matter requires only a small quantity of coal to be reduced to lime. Some of it, which takes a tolerably good polish, is sold as marble. The thickness of the limestone formation varies. At Pallion, near Sunderland, it is only about seventy feet thick; but this is near the north-western or under boundary: near Hartlepool it has been bored to the depth of more than 300 feet without penetrating through it. Along the coast the strata dip to the south-east. Galena is the only ore that Mr. Winch observed in this limestone, and few organic remains are found in it. Botryoidal masses (*i. e.* masses like a cluster of grapes) of fetid limestone, devoid of magnesia, in balls varying from the size of a pea to two feet in diameter, imbedded in a soft, marly, magnesian limestone, are found near Hartlepool. There are caverns and perforated rocks in this formation along the coast, which appear to have been formed by the action of the sea.

Under the article COAL-FIELDS the reader will find a general description of the coal-field of Northumberland and Durham. The following remarks apply more particularly to the county of Durham.

Of the dykes of basalt or greenstone which intersect the coal measures, one crosses the Tyne into Durham county, near the Walker colliery, and another crosses the bed of the Wear at Butterby, near Durham. In the south part of the county is a remarkable basaltic dyke, extending several miles from Cockfield to Bolam, where the coal measures dip beneath the newer magnesian limestone: a dyke of similar kind and in just the same line intersects the new red sandstone or red marl, and crosses the bed of the Tees near Yarm into Yorkshire. 'I have never been able,' says Mr. Winch, 'to trace any of these basaltic veins into the magnesian limestone, and am almost certain that, together with other members of the coal formation, they are covered by it.' In Mr. Greenough's Geological Map of England and Wales the Cockfield dyke and that which crosses the Tees are represented as parts of one vast dyke, extending from the upper valley of the Tees near Eglestone, through the millstone grit and limestone shale (or, as it is laid down in Mr. Winch's map, the mountain limestone), the coal measures, the newer conglomerate or magnesian limestone, the red sandstone, the lias, and the inferior oolite, in all sixty-five miles in an east-south-east direction, to the Yorkshire coast, between Scarborough and Whitby. The coal in contact with the dyke is charred and reduced to cinder; and the sulphur is sublimed from the pyrites near. A belt of trap rocks is marked in Mr. Greenough's map as extending across the coal measures in Bedlingtonshire. Besides the fissures filled with basalt, others of a different nature intersect the coal-field: these, if large, are also called dykes; but, if small, 'troubles,' 'slips,' or 'hitches,' and by some geologists 'faults:' by these 'faults' the strata are thrown, *i. e.* raised on one side or depressed on the other, many feet. Other irregularities are observed in the coal measures, such as the depression below their proper level of large wedge-shaped portions of the strata; fissures which divide the strata, but do not alter their level; basin-formed depressions in the floors of the seams, called 'swellies' by the miners, by which the coal is materially thickened, the roof of the seam preserving its regularity; and 'nips,' where the coal nearly disappears, the roof and the floor of the seam coming almost into contact. Mineral springs are found in various parts of the coal-field, and chalybeate springs occur in every part of it.

The coal-field of Durham is bounded on the west by the district occupied by the millstone grit. This district extends westward up the valley of the Tees to Eglestone, and is bounded by a line drawn from thence northward to Bollihope Beck, along that stream to the Wear above Wolsingham, and from thence north-west to the Derwent at Blanchland. The millstone grit extends northward into Northumberland, skirting the west side of the coal-field; and southward into Yorkshire, where it extends between the districts occupied by the newer magnesian or conglomerate limestone and the carboniferous or mountain limestone. The beds of this formation may be estimated at 900 feet thick; and this is probably short of the truth. 'The prevailing rock of this series is shale, known by the provincial name of "plate," with which various beds of sandstone, differing in hardness and texture, and, according to these differences, distinguished as freestone, hazle, whetstone, grindstone, and millstone, occur: of the latter only one bed is worked, the thickness of which is about thirty feet. This is one of the uppermost strata on the Derwent, where it crops out, and does not occur farther west.' (Phillips and Conybeare, *Outlines of the Geol. of England and Wales.*) The millstone bed is quarried on Muggleswick Fell, and between Wolsingham and Stanhope in Weardale. The grey millstones of Muggleswick are employed for grinding rye. Towards the lower part of this formation two thin beds of limestone occur, alternating with some occasional seams of coal. These coal measures are distinguished by their thus alternating with limestone from those of the principal coal formation.

The remainder of the county, west of the district occupied by the millstone grit, is occupied by the carboniferous or mountain limestone. The limestone beds in this formation repeatedly alternate with beds of siliceous grit and slate-clay, to which they bear not so great a proportion as one to three, so that it is not very easy to draw the line of demarcation between the beds of this formation and those of the millstone grit. Mr. Winch, from whose account we have largely borrowed, classes both formations under the common designation of the lead-mine measures. He estimates their joint thickness at from about 2700 ft. to 2750 ft., and the aggregate thickness of the limestone beds at 576 ft.: deducting the thickness of the millstone grit as given above, that of the mountain limestone will be about 1800 ft. or 1850 ft., of which the limestone beds amount to 570 ft.: this includes about 250 ft. of sandstone and slate-clay, lying immediately above the old red sandstone, which is the formation subjacent to the mountain limestone. The limestone beds are the most characteristic of this formation, and the most important to the miner. The bed called 'the great limestone' is from sixty to nearly seventy feet thick, and consists of three strata, divided by indurated clay. It is the uppermost bed in this formation, and crops out at Frosterly, in Weardale, between Wolsingham and Stanhope, where it is quarried in large quantities for agricultural uses and building cement, or for ornamental purposes: it is a brownish-black or dark bluish-grey marble, in which bivalve shells are imbedded. 'The scar limestone,' a lower bed, thirty feet thick, is divided into three strata like the great limestone, which it also resembles both in colour and organic remains. 'The Tyne-bottom limestone,' above twenty feet thick, is also divided into three strata: 'Robinson's great limestone' is above eighty feet thick. All the limestones of this formation appear to contain the encrinus, and most of them also bivalve shells: one of them (the cockleshell limestone) contains oyster shells of four or five inches diameter. They seem to agree in every essential character, as well as in their extraneous and native fossils. The beds of sandstone which occur in this formation are thicker than those in the millstone grit: they are thickest towards the bottom of the series. The beds of shale, or, as it is called, 'plate,' are very numerous: they are seldom so much as forty feet in thickness, but one bed is sixty feet. Iron pyrites, imbedded in shale, is found in abundance; but owing to the high price of fuel and the great distance from any seaport, cannot be manufactured into green vitriol with any advantage. Clay ironstone is found in Teasdale; there are no iron works in this county.

The carboniferous limestone is the great depository of the metallic veins of the district which comprehends the great Northumberland and Durham coal-field. Lead mines abound in Weardale and in Teasdale Forest, and there are a few in the valley of the Derwent. Of the fissures which contain the lead ore, such as range from north to south are called 'cross veins,' or sometimes 'dykes;' they are generally of great magnitude, but yield very little ore: the fissures which run from south-east to north-west are most productive; they are from three to six feet wide. These cut through the cross veins, which are frequently rendered productive to some distance from the points of intersection. The hade of the veins is variable in direction and in degree: where those in Weardale point east and west, they hade to the south: the strata are elevated on the side to which the veins dip. The same vein is productive in different degrees according to the bed which it traverses: the limestones are the chief depositories of ore, particularly 'the great limestone,' which is considered to contain as much as all the other beds put together: next to the limestones, the strata of sandstones called 'hazels' are to be ranked in point of productiveness, but the lead-bearing veins appear to be compressed between these hard beds. Galena is the only lead ore procured in abundance from this formation: but white and steel-grained ore are occasionally found: silver is contained in the ore in different proportions, varying from two to forty-two ounces in the fother of 21 cwts.: twelve ounces may be considered as the general average, and if eight can be obtained, the lead is worth refining. Newcastle and Stockton are the ports at which lead is shipped. (*Geological Transactions*, vol. iv.; Conybeare and Phillips, *Outlines of the Geol. of England and Wales.*)

Agriculture.—The climate of the county of Durham is mild for its northern situation. The sea, which bounds it on the east, moderates the cold in winter; and the surface, being hilly without any considerable mountains, presents many sheltered valleys, the climate of which nearly resembles that of the more southern parts of the island. The soil varies in different parts; its general nature is that of a rather strong loam. In the south-eastern part of the county northward from the mouth of the Tees, is a tract several miles in breadth, stretching along the coast towards Hartlepool, where the stiff loam is rich and productive. Next to this, to the east and north, to within a few miles of Sunderland, is a very poor thin clay, with a very hard and impervious subsoil, on which neither corn nor grass will thrive without great labour and expense. Westward of this lies a strip of excellent loam on a limestone rock, which affords the soundest pastures and the best grass, and is fit for any kind of crop. In the centre of the county there is a moist clay loam, of moderate quality, on an ochre subsoil, which gradually becomes peaty, and joins the western portion of the county towards Cumberland and Westmoreland, the whole of which last-mentioned part of the county is a poor peat or moor, chiefly covered with heath. From Barnard Castle to Darlington there is a strip bounded by the Tees on the south, which consists of a dry loam intermixed with clay. In this there are some good pastures and productive farms. In the valleys of the Tees, Skerne, Tyne, and their tributary streams, the soil is in general above the average of the district around, and consists of a good friable loam, which is cultivated at a small expense, and under good management is sufficiently profitable to the occupier.

A great part of the county lay at one time in open commons and common fields, most of which are now divided and enclosed. The moors and heaths that remain are chiefly in the poor district to the westward, and even there cultivation has spread very generally; and the wastes are profitable, in some degree, by rearing a hardy breed of sheep and cattle. The general state of cultivation throughout the county is above mediocrity; and improvements have been more readily adopted than in some more southern parts of the island. Fallows are found indispensable on cold wet clays; but wherever turnips can be raised this useful root supersedes the old summer fallow. The fallows are usually dressed with lime, which is no doubt a proper application on cold clay soils; but the use of it has been so customary (being inserted as a condition in many leases), and is so erroneously considered as a substitute for dung, that it is often applied injudiciously, and with little or no advantage. In many old leases there was a clause to oblige the tenant to lay all his farm-yard manure on the old grass land, which effectually prevented the improvement of the arable part of the farm.

Lime being thought a sufficient manure for the arable land, the consequence was the gradual deterioration of the latter, without a proportional improvement of the meadows. But a better system has been introduced. The lime is now usually put on when old grass land is broken up or converted; and where arable land has been repeatedly limed, good rich dung is found to be more profitably employed, when ploughed in, than when used as a top-dressing for grass. There is little or no marl found in the county.

The rotation usually adopted on the better soils includes two or three years of grass, and begins invariably with turnips, well manured, and drilled according to the Northumberland method. [DRILLING.] The convertible husbandry described in the account of the agriculture of BERWICKSHIRE is very generally adopted by the best farmers, and found most profitable in the end.

The occupations are not, in general, very large. There are some few extensive farms; but the average size is from 150 to 200 acres of inclosed land. There are many small occupations of 40 and 50 acres, which is as small a farm as can be cultivated with profit, unless the spade husbandry be adopted, which is not yet done to any extent in this county.

The implements of husbandry have nothing peculiar in them. The ploughs are chiefly of the improved kind: the old heavy clumsy ploughs are scarcely ever seen in use. Horses are almost exclusively used for agricultural purposes; and an ox team is a rarity. It is found that oxen are more profitable when fatted at a young age for the butcher, than when used to work on the farm. Threshing-mills are common, and there is not in the northern counties that foolish prejudice of the ignorant labourers, which made many of them rise to destroy threshing-machines in more southern counties, and which still prevents the use of them where they would be highly advantageous, not only to the farmer, but also to the labourer, who would then not so often suffer the pains of rheumatism in his old age, the consequence of the continued exertions of his limbs on the threshing-floor.

Corn is sown by the drilling-machine wherever the soil is sufficiently friable, or is made so by good tillage. In heavy soils the broadcast method of sowing still prevails.

There are many rich upland meadows and permanent pastures, where cattle and horses are bred to great advantage, and where oxen and sheep are fattened by grazing; but there are very few water-meadows, although there are many situations where they might very easily be established. The quantity of hay on the upland meadows is on an average 1½ tons per acre: 2 tons is considered a heavy crop. They have a method of drawing together the cocks of hay, when it is fit to be stacked, which saves the loading on waggons. This is done by means of a wooden frame drawn by two horses. This frame is held in an oblique position, and partly drawn under the cock so as to scrape the surface and force the hay upwards. It slides on the mown grass, and is drawn to the stack, which is made to contain ten or twenty tons. It is but slightly thatched when completed: several small stacks used formerly to be placed in various parts of a large piece of grass land, and in winter the cattle were left in the fields, and pulled the hay out of the stacks all around, sheltering themselves near them. This was a great waste of hay, and a very unequal distribution of the manure. A better system prevails now, and the cattle are kept in yards, where the dung is more carefully collected and increased with straw, and where the hay is brought as it is cut out of the stack, by which means none of it is wasted. The best meadows are mown every year, and manured every third or fourth year. Some prefer mowing and feeding alternately, which keeps the land in good heart and the herbage fine. Horses are generally considered as detrimental to the pasture; their manure is too hot, and brings coarse weeds forward. Sheep greatly improve the pastures, and are in consequence preferred.

When grass land is ploughed up and converted into arable, the practice of paring and burning the surface is very generally adopted. The first crop after this is generally turnips, which seldom fail when sown with fresh-burnt ashes. The next crop is wheat or oats; after which, if the soil is very stiff, a clean fallow succeeds; if it is lighter, another crop of turnips, which brings the land in a proper state for a regular course. This appears to be a most excellent practice, and far superior to the old Devonshire plan of taking as many crops of corn, after burning the sod, as can be made to grow. When the surface is not burnt, the usual course is to plough the grass up in autumn, and let it lie all the winter to rot: it is then ploughed again in spring, and sown with oats: the next year it is fallowed, and prepared for the course which is thought to suit the nature of the soil.

This county is not remarkable for its gardens or orchards. The soil and climate are not very favourable to fruit-trees, and, except in the gardens of gentlemen of fortune, they are not much attended to.

There are some good oak woods, and many new plantations, where the tenure is freehold. Where it is copyhold, under the bishop of Durham, one-third of the timber, above what is required for repairs of buildings, belongs to the bishop, which is an insurmountable obstacle to planting—and where the land is held on lease, renewable every seven years on an uncertain fine, every improvement increases the sum demanded. Many of these lands have been enfranchised by Act of Parliament, with the consent of the bishop; but many still remain on the old tenure.

The cattle bred in the county of Durham are in great repute all over England and Scotland, and a great number are annually purchased at the different fairs in this county, and driven northward and southward. The Teeswater or Holderness breed is the finest of the short-horns. The cows are remarkable for the quantity of milk which they give, as well as their aptitude to fatten. The oxen are considered as the most profitable breed for stall-feeding, as they become fit for the butcher at an earlier age than most other breeds. The milkmen near London and other large towns scarcely ever have any but Durham cows, some of which will give twenty-five to thirty quarts of milk per day for several months. When they become dry they increase so fast in flesh and fat, that they are soon very advantageously disposed of. They are of a quiet disposition, and bear to be kept continually tied up in stalls; and they accommodate themselves readily to every kind of food, whether it be grass or hay, roots, grains, or distillers' wash. This breed came originally from Holland, as is asserted, and this appears probable: but it has been much improved by a careful selection of bulls to breed with. This may be attributed to a few skilful and zealous breeders. The famous Durham ox at ten years old weighed alive 34 cwt. He was slaughtered at eleven years old, in consequence of an accident by which he dislocated his hip joint; and although wasted by being eight weeks in great pain, his carcase produced 165 stones 12 lbs. net meat (14 lbs. to the stone), and above 21 stones of hide and tallow. In June, 1801, when he was five years old, the proprietor refused 2000*l.* for him, and made a great deal of money by showing him all over the kingdom for six years. (Bailey's *Agricultural View of the County of Durham.*)

The milk of the Holderness cows, although abundant, is not so rich in cream as that of some of the smaller breeds. But quantity and quality are seldom united, and the dairymen who make butter or cheese prefer cows of different breeds, which give rich milk, but do not get fat so readily.

The horses bred in this county are of a superior description, both for draught and for the saddle. The Cleveland bays are preferred for their vigour and activity. For farming work and drawing loads of coal or lime few horses surpass them. A good horse will draw in a cart nearly a ton of coals from the distance of thirty, and even thirty-five miles, over hilly and rough roads; going and returning in the twenty-four hours, without any considerable rest, and often without being out of harness the whole time: he will do this three times in the week, and do light jobs the other days. Horses can take longer journeys in hilly countries than in flat, without being distressed, as is well known. Hunters of superior power are produced by crossing strong active mares with blood horses which have great bone as well as spirit; or better, by having a breed produced by selected half-bred stallions and mares. A good hunter is a more valuable horse for the breeder than a race-horse, which may prove a prize hereafter, but seldom remunerates the breeder for his risk and trouble.

The young stock are kept in rich and extensive pastures, where they have plenty of food and good water. The dry pastures on the limestone rock are peculiarly adapted to rear horses, the sound soil being very advantageous to the proper hardness of the hoof.

There was once a very large breed of sheep in the south-eastern part of the county, which bore heavy fleeces, and when killed often weighed from 50 lbs. to 60 lbs. the quarter. But the improved Leicester breed has nearly superseded them, as being more profitable, and fattening at an earlier age. There is a small and hardy species of sheep on the heaths and moors, which is similar to those found in other counties on the same description of land. They cost little to maintain, and produce little, but when fatted at four or five years old, the flesh is rich and delicate.

There are some very large fairs held in the county: the following are the chief:—

Durham fair, on the 21st of March; a great fair for horses, which continues a week; one of the principal horse-fairs in the north. On the Saturday before the 12th of May, cattle and horses, and hiring servants; Whitsun-eve, cattle, horses, sheep; 15th of September, horses and cattle; Darlington, first Monday in March, a great fair for cattle, horses, sheep; Whitsun Monday, ditto; Monday fortnight after Whit Sunday, cattle, sheep; Barnard Castle, Easter Monday, Whitsun Monday, Maudlin-day (2nd of August), cattle, horses; Bishop Auckland, Thursday before Ascension day; Corpus Christi day, Thursday before 10th of October; South Shields, 24th of June, 1st of September, holiday fair; Sunderland, May 13th, October 11th, ditto; Hartlepool, May 14th, November 27th; Stockton, July 18th, Monday after October 13th; Wolsingham, May 18th, September 21st.

There are weekly markets at Durham, Wolsingham, South Shields, Barnard Castle, Stockton, Bishop Auckland, Sunderland, and Staindrop.

Divisions, Towns, &c.—The county of Durham is a county palatine, *i. e.*, a county within which some lord had a jurisdiction 'as fully as the king had in his palace;' but a late Act of Parliament having transferred the palatinate jurisdiction from the bishop of Durham, by whom it was long held, to the crown, the distinction has been for most practical purposes abolished. Like the other three northern counties, Durham is divided, not into hundreds, but into wards: of these wards there are four, as follows:—

I. Chester ward, which occupies the northern part of the county: it is bounded on the north by the Tyne and Derwent rivers, on the east by the sea, on the south-east and south by the Wear, the Derness Beck, and a line drawn from the junction of the Hedley and Derness Becks to Shorngate Cross, on Cross Ridge. Above a fourth of the land in this ward is heath. II. Darlington ward, which extends from the boundary of Chester ward to the boundary of the county on the west and south: it is bounded on the east by an irregular line drawn from the junction of the Croxdale Beck with the Wear, to the junction of the Skerne and the Tees: a large proportion (four-ninths) of the land in this ward is heath. III. Easington ward, which is bounded on the north by Chester ward, on the west by Darlington ward, on the east by the sea, and on the south by a line drawn from Croxdale Beck eastward to the sea.' IV. Stockton ward, which occupies the remaining portion of the county. Islandshire, Norhamshire, and Bedlingtonshire, which are usually termed 'the north bishopric,' are included in Chester ward: Craike is included in Stockton ward. Chester and Darlington wards are further subdivided into three divisions each, beside the outlying portions of the county which the former comprehends; Easington and Stockton into two divisions each. The area and population of these divisions are given in the population returns for 1831 as follows:—

		Statute, acres.	Inhabitants.
Chester ward.	Islandshire . .	26,820	8,183
„	Norhamshire . .	18,810	3,744
„	The remaining part .	158,060	88,878
		203,690	100,805
Darlington ward		282,480	55,904
Easington ward.	Durham city . .	10,260	10,135
„	Sunderland town .	120	17,060
„	The remaining part	77,120	47,321
		87,500	74,516
Stockton ward, including Craike .		105,860	22,685
Total of the county . .		679,530	253,910

The county includes one city, Durham on the Wear, seven borough towns, viz.—Auckland (Bishop), on the Wear, in Darlington ward, pop. 2859: Barnard Castle, on the Tees, in Darlington ward, pop. 4430: Darlington on the Skerne, in Darlington ward, pop. 9417: Gateshead on the Tyne, in Chester ward, pop. 15177: Hartlepool on the Sea, in Stockton ward, pop. 1330: Stockton on the Tees, in Stockton ward, pop. 7763: and Sunderland, at the mouth of the Wear, in Easington ward. To these we may add the new parliamentary borough of South Shields on the Tyne, in Chester ward, pop. 18,756. Some of these are described elsewhere. [AUCKLAND, BARNARD CASTLE, DURHAM (CITY), GATESHEAD, SHIELDS (SOUTH), STOCKTON, and SUNDERLAND.] Of the remainder, as well as of the five market-towns of Sedgefield, Staindrop, Stanhope, and Wolsingham, an account is here subjoined.

Darlington is in a rich fertile country on the banks of the Skerne, 241 miles from London, and about 18 from Durham. The parish contains 7630 acres: it had, in 1831, [illegible] inhabited houses and a population of 9417. The parish is subdivided into four townships, of which that of Darlington with Oxenhall, or Oxneyfield (3470 acres, 1192 inhabited houses and 8574 inhabitants) contains the town. Darlington is situated on the eastern slope of a hill, at the foot of which the river flows, and consists of a square market-place, of which the church forms the eastern side, and several streets, or as they are designated 'gates,' branching from it. A bridge of three arches over the Skerne, near the church, communicates with the Yarm and Stockton roads. The church, dedicated to St. Cuthbert, is a cross church with a central tower, surmounted by a light spire. It is very ancient, except the east end of the chancel and the spire, which are modern: the interior also is so blocked up with modern screens and galleries that the shape of the church is very imperfectly seen. The general character of the architecture is early English, some portions so early as to appear almost of Norman character: the west end, where is the principal entrance, and the ends of the north and south transepts, are fine compositions; the doors are plain but good. In the chancel are three stone stalls of a date considerably later than the walls of the chancel. The church was formerly collegiate; the principal clergyman was called dean. The college was dissolved in 1550, and the whole of the revenues vested in the crown, except a small stipend reserved for the officiating minister: the church lands, subject to [illegible] crown rents, are now vested in the duke of Cleveland, who is patron of the benefice, a perpetual curacy worth [illegible] per annum. A former manor-house of the bishop of Durham is yet standing: after having been much neglected during the last century it was purchased of the see and converted into a parish work-house. The old toll-booth was removed and the present town-hall erected a few years ago. (Surtees's *Hist. of Durham*. London, 1823.) There are places of worship for Catholics, Methodists, and Protestant Dissenters.

The trade of Darlington is considerable: for a long period the principal manufactures were of camblets and other woollens: fifty years ago moreens and other like stuffs were made: the woollen manufacture was superseded in a great degree by that of linens, as huckabacks, diapers, sheetings, and checks; but this branch of industry has also experienced a declension, and the chief occupation of the inhabitants now is combing wool and making woollen yarn (which is applicable for imitation India shawls, Brussels carpets, &c.), spinning flax, grinding optical glasses, and founding [illegible]. The market is on Monday for corn and provisions of all kinds; there is a great market for cattle every fortnight. The population of the town has increased considerably within the present century: in 1801 there were only [illegible] inhabitants. The Darlington and Stockton railway has been already noticed. Darlington is a municipal borough by prescription: its privileges are at least as old as the [illegible] century: it is governed by a bailiff, who is appointed by the bishop: the limits of the borough comprehend only a part of the town.

The township of Darlington had, in 1833, one infant school with 50 or 60 children; a well-endowed grammar school, founded by Queen Elizabeth, containing 53 boys and 12 girls; a Lancasterian school of 148 boys with a lending library attached; two national schools with 266 boys and 240 girls, and a lending library attached; three day-schools, partly or wholly supported by charitable contributions, with 100 girls and 7 boys; eighteen other day-schools with [illegible] boys and 317 girls; five boarding and day-schools with [illegible] to 190 children of both sexes; a boarding-school for the sons of Catholic parents, with 43 scholars; and three Sunday-schools, one supported by Independents, with 70 boys and 50 girls, and two supported by Wesleyan Methodists for 282 boys and 306 girls. There are two sets of almshouses.

Between Darlington and the Tees are four round pools, popularly called 'Hell-kettles,' the three largest, which are near together, are nearly 120 feet in diameter and in depth 19½, 17 and 14 feet respectively: the fourth, which is some way from the others, is only 28 feet in diameter and 5 or 6 deep. In all of them the water stands to the brim, and is quite cold, but impregnated with sulphur, curdling with milk, and refusing to mix with soap. Leland mentions these pits, and says that it was conjectured that there was a subterraneous communication between them and the Tees; but as they are not affected by the floods or other variations of that river, the conjecture is now discredited.

Hartlepool is built on a small peninsula jutting out into the sea, a few miles from the Tees' mouth: the peninsula is partly formed by a pool, dry at low water, into which flows a small beck; this pool is called the Slake. In forming drains in it, human bones, trees, the wood of which was very perfect, stags' antlers, and teeth supposed to be deers' teeth, have been found. Hartlepool is in Stockton ward, 253 miles from London through Stockton. The parish comprehends an area of 840 acres, and had, in 1831, 275 inhabited houses and a population of 1330. The peninsula forms one of the most marked features of the eastern coast; the town, now much decayed, is on its south-western side near the entrance of the Slake. There appears to have been a monastery early founded here, of which St. Hilda was abbess: it is mentioned by Bede. It took its name from the island which Bede calls heoꞃꞇu or heoꞃꞇea, Hart's Water or Pool. Henry of Huntingdon calls it Insula Cervi, 'Hart's Isle.' This monastery was destroyed in the invasion of the Northmen, or Danes. The Normans, when they came into possession of the place, called it Hart-le-pol, the pool or slake of Hart, whence the modern designation. It appears to have been early a harbour of some consequence, for in 1171 Hugh, earl of Bar, son or nephew to Hugh Pudsey, then bishop of Durham, brought his fleet with an armament of Flemings (forty knights with their retinues and five hundred foot soldiers), intended to assist William of Scotland in his invasion of England, into the bay of St. Hilda.

In the thirteenth century, the territory of Hartlepool seems to have been in the family of De Brus of Annandale, the Bruces of Scottish history. King John, by charter A.D. 1200, erected it into a borough, and granted to Robert de Brus a weekly market and a yearly fair. In the course of the thirteenth century the walls were erected, and a small haven of nearly twelve acres formed. The walls inclosed and defended the town and haven on every side, except where the abrupt cliffs on the eastern side of the peninsula rendered defence needless: fifty years ago, these walls exhibited an almost perfect and interesting specimen of the defences of former times: a considerable part of them still remains. The old haven is now quite disused: the present harbour is formed by a pier run out on the south side of the town: it is the only safe harbour between Sunderland and Bridlington, easily accessible in every wind to light vessels or to laden vessels under 100 tons, which ride secure from the storms most frequent and destructive on the eastern coast, and in moderate weather can sail out with all winds. The town rises from the edge of the old haven towards the town moor, which occupies a considerable part of the peninsula, and on which the burgesses have right of common. It consists of one principal and several smaller streets. Its general appearance, when the corporation commissioners visited it, was mean, and little trade was carried on; but they state in their report, 'Wet docks are now forming under the provisions of a local act, and railways are proposed to be made from the coal-fields in the neighbourhood of the town. The formation of docks will probably make this port a considerable one. The estimate of the cost of the works commenced is 220,000*l.* Within the last ten months 120 new houses have been built, and others are constantly being erected. Ground for building sells at from 10*s.* to 1*l.* per square yard.' From the demand for building-land the town moor is estimated to be worth 20,000*l.* There is a town-hall, a mean building, erected about the middle of the last century. The market is on Saturday. The inhabitants are chiefly engaged in fishing many tons of fish are salted for exportation. Hartlepool is a place of some resort for sea-bathing.

The church, dedicated to St. Hilda, is on an elevated site at the south-east end of the town. It is a large and curious building, chiefly in the early English style: the south door has some late Norman enrichments. The chancel has been shortened, and various modern alterations made. The tower on the west end is tolerably lofty, with an embattled parapet and crocketed pinnacles: it is supported by very large and bold flying buttresses. The benefice is a perpetual curacy, in the gift of the vicar of Hart (Hart is the mother church of Hartlepool), of the yearly value of 143*l.* There was formerly a monastery of Franciscan or Grey friars. What is now called the Friary is an old house built after the dissolution by those to whom the site was granted; but some traces of older masonry are visible in the fragments of walls which surround the friary. There are meeting-houses for Wesleyan Methodists and Ranters. The corporation is governed by a charter granted by Elizabeth. It is not enumerated in the schedules of the Municipal Reform Act.

There were, in 1833, two endowed day schools and three unendowed, containing in all about 230 children; and three Sunday-schools, with 380 or 390 children. One Sunday-school has a lending library attached.

The shore of the peninsula is marked by rocks or cliffs which do not exceed 40 feet in height, and by several caverns or excavations. One cavern may be explored for nearly 50 yards: there is a tradition that it communicated with the church. There are the remains of a breast-work on the town moor and of some batteries along the shore. There are two chalybeate springs near the town.

When De Brus declared his pretensions to the Scottish crown, his English possessions were forfeited, and the borough of Hartlepool was granted to the Clifford family, by which it was long held. It was plundered by the Scots in 1312, and again taken by them in 1315, a year after the battle of Bannockburn: on the latter occasion the inhabitants saved part of their property on board some vessels then in the harbour. Hartlepool furnished five ships and 145 seamen to the fleet of Edward III. before Calais. In the northern rebellion under the earls of Northumberland and Westmoreland, in the time of Elizabeth, Hartlepool was taken by the rebels. The Scottish army, which came to the aid of the parliamentarians in the civil war of Charles I., took Hartlepool in 1644: it was retained by them till 1647, when they evacuated it, and it was occupied by a garrison of parliamentarians. Mr. Romaine, a well-known theological writer, was born at Hartlepool.

Sedgefield is in Stockton ward, on the road from Stockton to Durham, 251 miles from London, 9 from Durham, and 9 from Stockton. The parish contains 17,480 acres: it is divided into seven townships. The township of Sedgefield, which comprehends the town with the hamlets of Layton, Sands, and Hardwick, has an area of 6220 acres: it had, in 1831, 309 inhabited houses, and a population of 1429; of which about half was agricultural. The population of the whole parish was 2178. Sedgefield is a small neat town, with the appearance rather of a handsome village, and stands on an eminence commanding an extensive prospect over the vale of Tees and the Yorkshire hills beyond. The church, dedicated to St. Edmund, is one of the handsomest in this part of the county: the date and style of the architecture are different in different parts: there are some curious early English piers with enriched capitals, and some Decorated windows. The tower is in the Perpendicular style, turreted, and with four pinnacles. The chancel is divided from the nave by a rich screen of old oak with three stalls on each side: the chancel is wainscoted with old oak, and stalled with seven seats on each side. The font is a handsome octagon of black marble. The church-yard is spacious and shaded with trees. The living is a rectory worth 1802*l.* per annum, with a glebe house, on the lawn in front of which are some fine evergreen oaks. The bishop of Durham is patron of the living. There is a range of almshouses near the church, founded in 1702 by Mr Thomas Cooper, for five poor men and as many poor women. The market is on Friday. There were in the township of Sedgefield, in 1833, one boarding and day-school, and seven day-schools, one endowed, containing in all about 270 children; and two Sunday-schools, with 150 children. The rest of the parish contained two day-schools (one endowed), with 36 children.

Staindrop is in Darlington ward, 247¼ miles from London, about 7 miles to the right of the Glasgow and Carlisle mail-road, and about 19 miles from Durham. The parish contains 14,990 acres, and had, in 1831, 2395 inhabitants (besides some few who were included in the return from another parish); it comprehends six townships and part of a seventh. The township of Staindrop contains 1810 acres, and had in 1831 a population of 1478. Staindrop is an antient town situated in a beautiful vale, and was originally a royal demesne. Many of the houses are well built and chiefly form one wide street ranging east and west. Staindrop Beck runs at the east end of the town. The church, dedicated to St. Mary, is near the Beck; it is an antient fabric, consisting of a nave, side aisles, and chancel, with an embattled tower at the west end. The tower opens to the nave and south aisle; it is very plain. The church has some portions of early English character: the chancel has some good stone stalls and a fine monument in the Decorated English style: there is also in the church a rich monument of later date, to the memory of Ralph Nevill, earl of Westmoreland, and his wives. The church was formerly collegiate: the dwelling-place of the collegiate clergy and other beneficiaries was on the north side of the church. The revenues of the college were, at the dissolution, 170*l.* 4*s.* 6*d.* a year gross revenue, or 126*l.* 5*s.* 10*d.* clear. The market, which has been revived after long discontinuance, is on Saturday, for provisions: there is very little or no corn sold. The living is a vicarage united to the neighbouring rectory of Cockfield; their joint yearly value is 354*l.* with a glebe house; they are in the gift of the duke of Cleveland. There are congregations of Methodists and Independents at Staindrop. There were in the township of Staindrop in 1833 two infant or dame schools, with 40 children; seven day, or boarding and day-schools, with about 180 children, and three Sunday-schools with 230 children. The rest of the parish contained two day-schools (one partly supported by the duke of Bedford), containing nearly 60 children. Close to Staindrop is Raby Castle, the seat of the duke of Cleveland. The castle is on the east side of the park, which is very extensive. The principal part of the building was erected by John Nevill, earl of Westmoreland, in the fourteenth century; one part is even more antient. Many alterations have been made in the castle by subsequent possessors, but they have not materially affected its outward form, the general effect of which, from its extent, grandeur, and preservation, is very imposing. Its situation is fine: it occupies a rising ground, with a rocky foundation, and is inclosed with an embrasured wall and parapet. In this outer wall there is only one entrance, a gateway defended by two square towers. Several of the smaller apartments have been hollowed out in the walls, which are of great solidity and strength. This castle was the residence of the powerful family of the Nevills, earls of Westmoreland; but on the rebellion raised by the last of that family against Elizabeth his estates were forfeited. They afterwards came by purchase to Sir Harry Vane, from whom they have descended to the present owner. Many parts of the pleasure-grounds command extensive and beautiful views.

Stanhope is in Darlington ward, 262 miles from London, by a road which enters the county at Pierce Bridge, and runs through West Auckland and Wolsingham to Stanhope, and on to Aldstone Moor, in Cumberland. The parish, which comprehends 55,030 acres, is one of the largest in England: it had in 1831 a population of 9541. It is divided into four townships, of which Stanhope quarter township, in which is the town, comprehends an area of 13,010 acres, and had in 1831 233 inhabited houses and a population of 2080, chiefly engaged in the lead mines. The town is on the northern bank of the Wear. The church, dedicated to St. Thomas, is on a rising ground on the north side of the town; it is a plain and antient building. On the west side of the town is an eminence called the Castle Hill, rising to the height of 108 feet perpendicular from the bank of the Wear. The summit is of an oblong figure, thirty paces wide, divided by a ditch into two irregular parts; another ditch defends the acclivity on the north and east; the summit is supposed, from foundations discovered many years since, to have been once surrounded by a wall of ashlar work strongly cemented. The tradition is a fortress of remote origin demolished in an he Scots. At a short distance from the town a spacious old building called Stanhope Hall, once the manor-house of the Featherstonehaugh family. The market is on Friday: there were two annual fairs, but they are disused. The living is a rectory in the gift of the bishop of Durham, of the yearly value of 4848*l.*, with a glebe-house. There were in the whole parish in 1833 one endowed day-school, with nearly 40 children; one national school, partly endowed, with 60 children; two day-schools partly supported by endowment and subscriptions, with [illegible] children; and two other day-schools unendowed, with [illegible] children; five day and Sunday-schools, with nearly [illegible] children; and four Sunday-schools with 282 children. Several of the schools had lending libraries attached. Near the town on the north side is a remarkable cavern, said to be a mile long, and to abound with stalactites.

Wolsingham is in Darlington ward, 256¼ miles from London on the road to Stanhope and Aldstone Moor. The parish comprehends an area of 24,780 acres, and had in 1831 439 inhabited houses, and a population of 2239. The town is pleasantly situated on a point of land formed by the confluence of the Wear and the Wescrow, on the north side of the former river. The church, dedicated to St. Mary and St. Stephen, is on the north side of the town, but has nothing remarkable about it: near it are the remains of a considerable building, supposed by some to have been part of a monastery founded by Henry de Pudsey; by others to have been an antient manor-house of the bishops of Durham. The market is on Tuesday, for butcher's meat, butter, potatoes, and corn. The quantity of corn sold is not great, but the prices are commonly as high as any in the county. It is chiefly for the supply of the lead-mine district, which commences between this town and Stanhope. The district is easily recognized by the large parcels of lead lying near the sides of the road, and by the blue unwholesome vapours which proceed from the smelting-houses. The views down the Wear from the hill above Wolsingham are very extensive and much diversified. The living of Wolsingham is a rectory in the gift of the bishop of Durham, of the yearly value of 791*l.*, with a glebe-house.

There were in Wolsingham parish in 1833 one school, partly supported by endowment, with 52 children; another, partly supported by charitable contributions, with [illegible] children; a third supported by a private benefaction, with 48 children; these were all day-schools, and there were six other day-schools, with 144 children; there were also [illegible] Sunday-schools, with 130 children. There is a Baptist congregation in the parish. Wolsingham parish is divided into seven 'quarters,' or hamlets.

Beside the above market-towns, Hutchinson (*Hist. of Durham*, 4to., Carlisle, 1794, vol. iii. p. 285) speaks of a market being held at the chapelry of St. John, in Weardale. The chapel of St. John is on the south side of the Wear, about seven miles from Stanhope, on the road to Aldstone Moor: it is a handsome building, rebuilt several years ago by Sir Walter Blacket. The benefice, which is a perpetual curacy, worth 186*l.* a year, is in the gift of the rector of Stanhope, or rather the inhabitants nominate and the rector approves. The market, which is on Saturday, was established for the benefit of the miners, of whom, when Hutchinson wrote, 800 were employed in the neighbourhood, and the number has probably increased since. The valley of the Wear is here deep and narrow; there is a stone bridge of one arch over the river.

Beside the market-towns, there are in the county several villages of sufficient importance, historical or commercial, to require notice.

Chester-le-Street is on the high north road between Durham and Newcastle-upon-Tyne, six miles from Durham, and eight and a half from Newcastle. The parish comprehends an area of 31,260 acres: it is mostly in Chester ward, to which it gives name, but extends into Easington ward: its population in 1831 was 15,478. It is divided into [illegible] chapelries or townships, of which the principal, with their areas and population in 1831, are as follows:—Chester-le-Street (chapelry), 2940 acres, 1910 inhabitants; Tanfield (chapelry), including Beamish and Lintz Green (townships), 6760 acres, 2498 inhab.; Birtley (township), 1480 acres, 1520 inhab.; Harraton (township), 2090 acres, 2171 inhab.; Lamesley (chapelry), 3390 acres, 1910 inhab.; and Great Lumley (township), 1730 acres, 2301 inhab.; the last, with the two smaller townships of Lambton and Little Lumley, is in Easington ward; the others in Chester ward.

The name of Chester-le-Street gives this place a [illegible] claim to be considered a Roman station; yet neither the name nor the exact site of the station (which some would remove as much as a mile from Chester) has been determined. The Saxons called Chester, from the name of the brook, Cone, which flows past it, Coneceastre, or Cuneceastre: it became A.D. 882 the seat of the bishopric, which was removed hither from Lindisfarne, and it retained its episcopal rank until 995, when a Danish invasion drove away the bishop and his clergy, who afterwards settled at Durham. The church, after losing its rank as a cathedral, became first rectorial, afterwards collegiate: the manor has been constantly vested in the see of Durham. The revenue of the college at the dissolution was 77*l.* 12*s.* 8*d.* The present village extends nearly a mile along the north road; another more irregular line of houses runs along the brook at right angles to the main street. The church consists of a nave with side aisles, a chancel, and a tower at the western end, surmounted with a lofty spire rising to the height of 156 feet from the ground. The lower part of the tower is of Early English, with a Perpendicular west door and window of later insertion, and with massy buttresses: the upper part of the tower, which is of later date, is octagonal; it has an embattled parapet and four pinnacles; the spire is also octagonal. The interior of the church and many of the windows have been modernized: there are some remains of painted glass: the north aisle contains the monuments of the Lumley family: there are fourteen altar tombs with as many stone effigies, mural tablets, &c. The living is a perpetual curacy, worth 377*l.* per annum. The deanery-house, so called as being built in place of the former residence of the dean of the collegiate church, is a handsome brick house; there are no vestiges of the antient buildings.

Lumley Castle, in the township of Great Lumley, is on a fine gradual elevation above the Wear. It is a quadrangle of yellow freestone, with an open court or area in the centre, with four uniform towers. It is an antient building, and the east front retains its former magnificence: a noble gatehouse projects from the centre, with overhanging turrets: this front overhangs a ravine through which the Lumley Beck flows; on the west and south the ground slopes gradually down to the Wear. The castle was probably built in the latter part of the fourteenth century. The pictures are chiefly portraits of the antient family of the Lumleys. The village of Great Lumley is a mile and a half from Lumley Castle. It contains an almshouse or hospital for twelve poor women, founded in 1686 by John Duck, alderman of Durham.

Lambton Hall, the seat of the earl of Durham, was built in 1797 on the site of the old house of Harraton, the former seat of the Hedworths: the grounds are pleasant, but the building displays many incongruities. Ravensworth Castle, the seat of Lord Ravensworth, is a modern building: its style is varied, being a selection from the castle architecture of different periods, not too remote however to be brought into contact. The park includes a heronry. In a private road near the castle there is a cross with a plain shaft and pedestal.

Lamesley and Tanfield chapels are modern buildings. Besides the noblemen's seats already mentioned, the parish contains the residences of several of the gentry.

There were in the whole parish in 1833 seven day-schools with 243 children, wholly or in considerable part supported by endowments or other charitable contributions; forty-seven other day-schools with 1325 children; and fourteen Sunday-schools with 1220 children. Three of the endowed schools are Sunday-schools also, and are attended by more children on Sunday than in the week. Two schools have lending libraries attached. There are several congregations of Wesleyan Methodists in the parish.

Jarrow, or Yarrow, is between Newcastle and South Shields: the church is 8 miles from Newcastle, and 2½ from Shields; but when the tide is out a mile may be saved between Jarrow and Shields by crossing 'the Slake,' a recess in the south bank of the Tyne, dry at low water. The parochial chapelry of Jarrow is tolerably extensive, comprehending 8640 acres, and having in 1831 a population of 27,995. It is in Chester ward. It is divided into five chapelries or townships; two of which, the townships of South Shields and Westoe, constitute the parliamentary borough of South Shields. Of the remaining three divisions, Harton township contained in 1831 1000 acres and 217 inhabitants; Jarrow, with Monkton chapelry, 3690 acres and 3598 inhabitants; and Heworth chapelry 2190 acres and 5424 inhabitants. The parish of Jarrow antiently extended across the Tyne, and comprehended a portion of Northumberland; but all connection with this part has long ceased.

Jarrow was very early the seat of a monastic establishment of the Benedictine order. An inscription stone states that the original church was founded A.D. 685. The monastery was established A.D. 681, by Benedict, a noble Saxon, who had previously founded the monastery of Monk Wearmouth, and the fabric was completed four years afterwards. Jarrow derives its chief interest from its connection with the Venerable Bede [Beda], whose birth is fixed by an antient and probable tradition at the hamlet of Monkton, which nearly adjoins Jarrow. In A.D. 870 the monastery was burned by the piratical Northmen, or Danes, but rising from its ruins, was again destroyed in the ravage of the country north of the Tyne by William the Conqueror, A.D. 1070. It again revived, but in A.D. 1083 William, bishop of Durham, removed the monks to Durham, and reduced Jarrow to the condition of a cell to the Benedictine monastery of St. Cuthbert there. Its yearly revenues at the dissolution were valued at 40*l.* 7*s.* 8*d.* gross, 38*l.* 14*s.* 4*d.* clear. The site of the monastery is near the western side of 'the Slake,' not far from the bank of a small beck which flows into the Tyne. Many ruins of the monastery still remain, but they are so scattered and confused that it is difficult to form a conjecture as to the original appearance and the arrangements of the convent, or even to distinguish them from the remains of a lay mansion that was erected upon its ruins. The church adjoins the centre of the monastic buildings immediately on the north. The tower rises from the centre of the church, between the nave and the chancel. The church was rebuilt, with the exception of the tower and part of the church, in 1783. The tower retains some curious Norman features. It has round-headed double lights on every side. A rude oaken seat, which appears to have been hewn out with an axe, is exhibited in the vestry as Bede's chair: the boards which form the back are modern; the rest is doubtless very antient. Roman inscriptions and pavements have been dug up near Jarrow, and it is conjectured, from the appearance of some of the stones, that the church and monastery were partly constructed of the fragments of a Roman building. There are large coal works at Jarrow: a row of houses for the colliers extends nearly a mile to the west of the church. The living is a perpetual curacy of the annual value of 197*l.* The chapelry of Monkton and Jarrow contained in 1833 nine day-schools, with 289 children; and five Sunday-schools, with 505 children.

Heworth is a chapelry in the parochial chapelry of Jarrow: it contains an area of 2190 acres; and had, in 1831, a population of 5424: it is divided into Upper and Nether or Low Heworth. The chapel at Low Heworth is a modern building, but probably occupies the site of one not less antient than the church at Jarrow. Some very antient coins of the Saxon kingdom of Northumberland were some years since dug up in the chapel-yard. One corner of this chapel-yard contains a monument, a neat plain obelisk, nine feet high, fixed on a stone base, to the memory of ninety-one persons killed in the explosion of Felling colliery, 1812. There is a parish school-house, built by subscription in 1815; this school contained in 1833 131 children. There were at the same time eleven other day-schools, with 351 children, and five Sunday-schools, with 556 children. At Heworth Shore on the Tyne are manufactories of Prussian blue and other colours, one for coal tar, and an establishment for preparing alkali for soap boilers; also ship-building yards, a pottery, a glass-house, a lead refinery, wharfs for grindstones, a brown paper mill, an establishment for preparing fish oil from the blubber brought by the Greenland ships, &c. Freestone of an open porous character, called from its excellence in enduring a strong heat, firestone, is quarried at High Heworth.

Winlaton is a manufacturing village between the Tyne and the Derwent. The township of Winlaton in the parish of Ryton in Chester ward comprehends an area 4540 acres, and had in 1831 a population of 3951 persons. Sir Ambrose Crowley, an alderman of London, established here about 1690 the extensive iron works which still bear his name. Sir Ambrose seems to have been peculiarly anxious for the well-being of his workmen, establishing regulations for their guidance, appointing a court of arbitrators to settle disputes, establishing schools, providing medical attendance for the sick, and advancing money to them, pensioning the superannuated, and providing for the families of the dead. All his charities, however, ceased in 1816. A chapel was built at Winlaton in 1705, as it is said, on the foundation of one destroyed in the rebellion of the northern earls against Elizabeth. The chapel was abandoned by the company carrying on the iron works, and having gone to decay was pulled down in 1816, and a national school-room built in its place, in which the rector of Ryton or his curate voluntarily performs service. There were in 1833 two national schools with 190 children, seven other day-schools with 239 children, and two Sunday-schools with 100 children.

Middleton in Teasdale is in Darlington ward: it lies on the north bank of the Tees, on the road from London to Haltwhistle. The whole parish comprehends an area of 38,410 acres, of which the township of Middleton includes 9750 acres. The village is situated among hills, and extends in somewhat an oval form round a spacious green. Almost every house is used for the sale of liquors or of some kind of goods. The inhabitants (who, in 1831, were 1824 for the township, or 3714 for the whole parish) are chiefly engaged in the numerous lead mines near. The church is small, but antient: the living, a rectory in the gift of the crown, is said to be worth 1500*l*. per annum: it does not appear to have been included in the return laid before parliament of the revenue of the church. Some of our authorities assign to this place a weekly market held on Thursday: it is probably a customary market. The township contained, in 1831, one endowed day-school, with 50 children; two unendowed day-schools, with 45 children; one day and Sunday-school, with 150 day or 180 Sunday scholars, supported by the Lead Company, who oblige their work-people to send their children either to this school or to some other. There is a considerable library attached to this last school, containing a variety of useful works, which are lent gratuitously to those of the scholars or of the workmen who desire to have them.

Houghton-le-Spring is in Easington ward, on the road from Durham towards Sunderland, 7 miles from Durham. The whole parish, which is divided into 18 townships or chapelries, contained, by the returns of 1831, 14,560 acres, and 20,524 inhabitants; of which 1220 acres and 3917 inhabitants were in the township of Houghton-le-Spring; 1590 acres and 5887 inhabitants in that of Hetton-le-Hole; 1310 acres and 2539 inhabitants in the chapelry of Painshaw; and 1460 acres and 2198 inhabitants in the township of Newbottle.

The village of Houghton is irregular and nearly half a mile long, at the head of a fine vale, sheltered on the north and east by limestone hills. It contains several handsome buildings. Houghton Hall is a heavy mansion, built probably in the reign of Elizabeth or James I., in the later Gothic style. The church is large, in the form of a cross, with a square tower, springing from four arches at the intersection of the transepts and nave. Some portions of the church are in the Early English, and some in the Decorated style: the east and west windows have fine Decorated tracery. The church contains the monument of Bernard Gilpin, some time rector of Houghton, 'the Apostle of the North,' and one of the most pious of the English church reformers: it is an altar tomb with pannelled sides, and a good specimen of the mixture of Gothic and Italian forms. The living is a rectory, in the gift of the bishop of Durham, of the yearly value of 2157*l*., with a glebe-house. On the north-east side of the churchyard, on a rising ground, is the grammar school founded by the exertions of Bernard Gilpin with the aid of some friends; and in the churchyard to the south of the school-house an almshouse for six poor people. Houghton had, in 1833, one boarding-school with 45 boys; nine day-schools, one a charity school with 38 girls; another a national school with 300 boys; the seven other day-schools had nearly 200 children; and three Sunday-schools with 656 children. The grammar school is not distinguished in the Parliamentary Returns from other schools.

Hetton-le-Hole is a mile or two south of Houghton-le-Spring. The increase of the population between 1821 and 1831, when it rose from under 1000 to nearly 6000, was owing to the extension of the collieries, which in 1831 gave employment to nearly 1800 men and boys, of whom above 1000 were upwards of twenty years old. There were at Hetton, in 1833, one day and Sunday-school with 68 day scholars and nearly 330 Sunday scholars; fourteen other day-schools with nearly 700 children, and two Sunday-schools with above 300 children.

Painshaw or Penshaw lies at some distance north of Houghton, on the banks of the Wear, at the western foot of a conical hill, Painshaw Hill: it is almost entirely occupied by persons connected with the collieries and stone quarries, the opening of which latter occasioned a considerable increase of population from 1821 to 1831. There is a chapel of ease, a plain convenient building, the minister of which is appointed by the rector of Houghton.

Newbottle is between Houghton and Painshaw. It is in a high exposed situation. A little to the north below the brow of the hill is Philadelphia Row, a group of houses entirely occupied by the colliers of the neighbouring pits. There is a considerable pottery at Newbottle. The population rather decreased from 1821 to 1831, from the decline of the collieries in the township.

Monk Wearmouth and Bishop Wearmouth are included in the parliamentary borough of Sunderland; and the parochial chapelry of Tweedmouth in Islandshire, which comprehends an area of 4520 acres, and had in 1831 a population of 4971 persons, may be considered as a suburb of Berwick-upon-Tweed in the parliamentary limits of which it is included. [BERWICK-UPON-TWEED, SUNDERLAND.]

Divisions for Civil and Ecclesiastical purposes. The county of Durham is in the diocese of Durham and in the ecclesiastical province of York. It constitutes an archdeaconry, which is subdivided into the deaneries of Chester-le-Street, Darlington, Easington, and Stockton. Of the outlying portions of the county, Islandshire, Norhamshire, and Bedlingtonshire are in the archdeaconry of Northumberland, except the parochial chapelry of Ancroft in Islandshire, which is in the archdeaconry of Durham. Craike is in the peculiar jurisdiction of the bishop of Durham. The number of parishes, as we gather from the population returns compared with the 'Clerical Guide,' is 60 of which 33 are rectories, 21 vicarages, and 6 perpetual curacies. The richer benefices are among the wealthiest in any part of England. Besides the 60 parishes, there are 15 parochial chapelries; and by the subdivision of these or the parishes, 24 district chapelries have been formed.

Some of the parishes and parochial chapelries are of great extent. Stanhope parish comprehends 55,030 acres or 86 square miles: Auckland, St. Andrew 45,470 acres or 71 square miles; Lanchester 41,890 acres or 65 square miles; Middleton in Teasdale 38,410 acres or 60 square miles; Chester-le-Street 31,260 acres or 49 square miles; Wolsingham 24,780 acres or 39 square miles; Gainsford 24,370 acres or 38 square miles; Brancepeth 21,850 acres or 34 square miles; besides eleven others, ranging from 10,000 to 20,000 acres, or from 15½ to 31 square miles, and several which approach 10,000 acres.

Durham is included in the northern circuit. The assizes and the quarter-sessions are held at Durham, where stands the county gaol and the house of correction.

Before the Reform Act there were four members returned to parliament from this county, two for the county itself and two for the city of Durham. By the Reform and Boundary Acts the county was formed into two divisions, each returning two members. The northern division includes Chester and Easington wards; the principal place of election is Durham, and the polling stations are Durham, Sunderland, Lanchester, Wickham (or Whickham), Chester-le-Street, and South Shields. The southern division comprehends Darlington and Stockton wards; the principal place of election is Darlington, and the polling stations are Darlington, Stockton, Bishop Auckland, Stanhope, Middleton in Teasdale, Barnard Castle, and Sedgefield. By the Reform Act two members were given to Sunderland, including part of the parishes of Monk Wearmouth and Bishop Wearmouth; and one member each to Gateshead (including part of the chapelry of Heworth in the parochial chapelry of Jarrow) and South Shields, including the townships of South Shields and Westoe in the parochial chapelry of Jarrow.

History and Antiquities. At the time of the Roman invasion the main part of the county of Durham was included in the territory of the Brigantes (Βρίγαντες Ptolemy), a powerful tribe who occupied the northern part of the island from the Mersey to the Tyne; the outlying portions, Islandshire, Norhamshire, and Bedlingtonshire, were included in the territory of the Ottadini (Oταδηνοι Ptolemy), whose country extended from the Tyne to the Forth. The Brigantes were subdued by Cerealis and Agricola, and the Ottadini by Agricola; but no incidents have been recorded of their subjugation which are peculiarly connected with this county

The main part of the county remained in the possession of the Romans until they finally withdrew from the island, being defended by the wall of Hadrian or Severus, which extended from sea to sea across Northumberland and Cumberland; the outlying portions being beyond the wall, were occupied by the Romans or not, as circumstances, or the character of the emperor, or the commander in the island, dictated. The notices of the district by the antient geographers are scanty. We gather from the Itinerary of Richard of Cirencester that the Tees was known to the Romans as the Tisa, the Tyne as the Tina, and the Tweed (which borders Norhamshire) as the Tueda; and from Ptolemy, that the Wear (Horsley will have the Tyne) was known as the Vedra. The Romans had several stations within the county. Vindomora and Vinovium, mentioned in the first Iter of Antoninus are fixed by antiquarians at Ebchester on the Derwent, and Binchester, near Bishop Auckland.

In Jeffreys' large map of Durham the Epiacum of Richard (which is placed by most at Lanchester) is fixed at Ebchester, with which both the name and the distance from Vinovium in Richard's Itinerary seem best to agree: in the same map the Longovicum of the Notitia is fixed at Lanchester, where Horsley proposes to place the Glanoventa of Antoninus. Ad Tisam, mentioned by Richard, is fixed at Pierce Bridge on the Tees. Gateshead was considered by Camden to be the Gabrosentum of the Notitia, which others place at Drumburgh near Carlisle; and Bremenium had been fixed at Monk Wearmouth; but this position is not to be reconciled with Ptolemy's mention of it. Perhaps there are few parts of the island of which the Roman topography is more obscure. Roman antiquities have been found at Chester-le-Street (coins), from whence Roman roads may be traced leading northward towards Newcastle-upon-Tyne, and southward to Binchester near Auckland; at Coniscliff or Conscliffe, near Pierce Bridge (an altar); Old Durham, near Durham city (coins); at Lanchester (inscriptions, coins, and other antiquities); at Pierce Bridge (coins, the traces of an aqueduct, foundations of houses, and other marks of a station); at South Shields (an inscription indicating that a Roman town or station was fixed here in the time of Marcus Aurelius); at Stanhope (an altar); at Thornton, near Darlington (an urn with coins, chiefly of Constantine and his sons); at Monk Wearmouth (coins); at Whitborn Lizard (coins). Reynolds' *Iter Britanniarum*, Cambridge, 1799.

In the establishment of the Saxon Octarchy, Durham was probably included in the kingdom of Deira, the southernmost of the two which are frequently comprehended under the general name of Northumberland. When Oswald, who united the two kingdoms under one sceptre, wished to introduce or rather revive Christianity, Aidan, a monk of Iona or elsewhere in Scotland, who had come as a missionary (A.D. 634), fixed his residence at Lindisfarne, or Holy Island, and established a monastery and a bishopric there. The seat of the Northumbrian bishopric was afterwards (A.D. 664) removed to York; but when, in 678, Northumberland was divided into two dioceses, Lindisfarne recovered its episcopal rank; and its diocese was permanently severed from that of York. Shortly after this time the see of Hexham was created, the diocese being severed from that of Lindisfarne. As the ravages of the Danes, towards the close of the ninth century, rendered Lindisfarne an insecure abode, the bishop and clergy forsook it (about A.D. 875), and, after they had wandered about for seven years, the seat of the bishopric was fixed at Chester-le-Street, where the foundations of a cathedral were begun. In the reign of Ethelred II. the ravages of the Danes were renewed, and the bishop and clergy leaving Chester-le-Street (A.D. 995), as deeming it insecure, removed first to Ripon, in Yorkshire, and afterwards to Dunhelm, now Durham, where the see has been fixed ever since. Lindisfarne, deserted by the bishop, was afterwards bestowed upon the Benedictine monastery of Durham, to which it became a cell. Its yearly revenues at the dissolution were valued at 60*l.* 5*s.* gross, or 48*l.* 18*s.* 11*d.* clear. The ruins of the conventual church still remain: the north and south walls, and great part of the west wall, are still standing: the east wall has fallen in. It has been a very magnificent building, in the Norman style. The length of the body of the church is one hundred and thirty-eight feet, the breadth eighteen, and with the two aisles thirty-six; but it may be doubted whether there ever was a transept. The stones appear red with fire, and on the south side of the chancel are honeycombed by the weather.

Upon the invasion of England by William the Conqueror, Egelwin, bishop of Durham, took the oath of allegiance at York to William, who had advanced into the north to crush the threatened resistance of the earls Morcar and Edwin. Robert Comyn, a Norman noble, to whom William had committed the charge of the entire subjugation of the north, having entered the city of Durham with his troops (seven hundred men), in 1069 or 1070, was overpowered by the population of the surrounding country, and cut off with all his men: the cathedral narrowly escaped destruction in this tumult. William, enraged at the disaster, advanced in person with his army, and laid waste the country with the most savage ferocity.

For sixty miles between York and Durham he did not leave a house standing, reducing the whole district by fire and sword to a horrible desert, smoking with blood and in ashes. He did not spare even the churches and monasteries. The ecclesiastics fled from Durham at his approach, and retired to Lindisfarne. A dreadful famine ensued, and a mortality not equalled in the annals of the country; the inhabitants were reduced to eat the flesh of horses, dogs, and cats, and at last even human carcases. The lands lay untilled for nine years, infested by robbers and beasts of prey; and the poor remnant of the inhabitants spared from the sword died in the fields, overwhelmed with want and misery. The treasures of the church, except those which the bishop carried away in his flight, were plundered either by the Normans or by Gospatric, who had purchased of William the earldom of Northumberland. The ravages of the conquerors were carried forward from the Wear to the Tyne, and the monastery of Jarrow was burned. Soon after William withdrew, the Scots, under their king Malcolm, invaded the north of England, routed the men of Teasdale, who opposed them near Eglestone, and burned Wearmouth monastery and Hartlepool. Egelwin, bishop of Durham, was one of those who endeavoured to organize in the Isle of Ely an opposition to William; but being taken prisoner, was cast into prison, where he died from famine or a broken heart. He was succeeded in the see A.D. 1072 by Walcher, a native of Lorraine, who seems to have been the first bishop that possessed the palatine jurisdiction so long exercised by his successors. Walcher, or those who acted under him, having provoked the indignation of the people by their oppressive conduct, the bishop was surrounded by a tumultuous assembly at Gateshead, and taking refuge in the church, the building was fired, and the bishop attempting to escape, was put to death in 1080. The insurgents got possession of the city of Durham; but having in vain attempted to make themselves masters of the castle, were obliged to disperse in order to avoid punishment. To revenge this popular outbreak, the country was again laid waste by an army under Odo, bishop of Bayeux, half-brother of William. The next but one in succession to Walcher was Ralph Flambard, in whose episcopate the diocese suffered diminution by the erection of the see of Carlisle; and the diocese of Hexham, which on the failure of its own bishops had been annexed to Durham, was taken from that diocese and annexed to York. For some years following 1140 the diocese was thrown into disorder by the usurpation of the see by one Cumin, a priest, a native of Scotland, who attempted to hold it in opposition to the regularly-appointed bishop. After a desultory warfare Cumin submitted.

In the year 1312 the Scots invaded the county of Durham, burned the suburbs of Durham, and plundered Hartlepool. They again invaded the county after the battle of Bannockburn, and for a third and fourth time in 1316 and 1317. Famine and pestilence followed the ravages of war, and the country became more desolate than at any time since the great Norman devastation. Marauders infested the country; and Lewis Beaumont, bishop elect (A.D. 1317 or 1318), was carried off by a party as he was proceeding to Durham to be installed.

In the beginning of the reign of Edward III. the Scots invaded the country, and took possession of the mountainous tract of Weardale; but the approach of the king with an army prevented them from penetrating into the more level districts of the eastern coast. In the year 1342 there is reason to think that they again invaded the country; and in 1346, under the conduct of their king David, they crossed the Tyne and the Derwent, and encamped about three miles from the city of Durham. Edward was in France; but the northern nobles and prelates collected a powerful army, and the battle of Nevill's Cross terminated in the defeat of the Scots and the captivity of David.

Durham does not appear to have been the scene of any remarkable event in the war of the Roses. The Yorkists, under the Marquis of Montacute, marched across it to attack the Lancastrians before the battle of Hexham. In the invasion of England by James IV. of Scotland, who favoured the cause of Perkin Warbeck, Norham Castle was besieged by the king; but when reduced to the last extremity, was relieved by the approach of the earl of Surrey with an army.

At the time of the Reformation the see of Durham was held by Cuthbert Tunstall, a man honourably distinguished in that persecuting age by his mildness and forbearance. He was imprisoned and deprived of his bishopric under Edward VI., the ample endowments of the see forming probably a greater inducement to his persecutor (Dudley, earl of Northumberland) than his steady adherence to the Catholic discipline. He was restored under Mary, but finally deprived after the accession of Elizabeth. The inhabitants of the northern counties were much attached to the antient church, and afforded full exercise to the laborious zeal of Bernard Gilpin and other Reformers. The religious establishments were not however richly endowed, with the exception of the priory at Durham. Kypen and Sherburn hospitals, which were among the wealthiest, had each considerably less than 200*l.* a year gross revenue. In the rebellion of the earls of Northumberland and Westmoreland in support of the Catholic faith, they found little difficulty in raising a tumultuous force, with which they entered Durham, tore and trampled under foot the English Bibles and prayer-books, and celebrated mass in the cathedral; and while a detachment occupied Hartlepool, the main body marched southward into Yorkshire. On the advance of the royal army under the earl of Sussex the insurgents retreated to Raby, and after losing some time in besieging Barnard Castle, which they starved into a surrender, they were obliged to disperse, the two earls escaping into Scotland. Northumberland was afterwards delivered up to the English and beheaded; Westmoreland escaped over sea, and entered into the service of the king of Spain. In the latter part of Elizabeth's reign the northern counties were much afflicted by a pestilence which broke out every year in some part or other. In 1597 the city of Durham suffered very severely.

In 1633 Charles I. visited the county, and was entertained by the bishop at his castle of Durham: again in 1639, on occasion of his progress northward to oppose the Scots, he received similar hospitality. When the Scots invaded England, in 1640, they crossed the Tyne into this county, Lord Conway, who commanded the king's troops, retreating first to Durham and afterwards to Northallerton, in Yorkshire. By a convention which followed, the county was for some time heavily taxed for the payment of the Scottish army. When the civil war broke out in 1642, the earl of Newcastle formed the four northern counties into an association for the king's service. The county was not the scene of any remarkable incident in that war. The Scotch army entered England in [illegible], in order to support the Parliamentarians. They were opposed by the Royalists; but though several skirmishes were fought in the country, no serious encounter took place; and the marquis of Newcastle being obliged to march into Yorkshire to sustain the royal cause there, Durham came into the hands of the Parliamentarians.

During the Commonwealth the see was dissolved: but upon the restoration of Charles II. it was re-established and bestowed on Bishop Cosins, who distinguished himself by the munificent use he made of his large revenues. The local history of the county since the Restoration is not marked by any interesting features.

STATISTICS.

Population.—Durham is one of the principal counties in which coal is raised: it does not rank very high as an agricultural county, being the thirty-ninth on the list in that respect. Of 59,045 males twenty years of age and upwards living in Durham in 1831, there were 11,329 engaged in agricultural pursuits, 2,547 in manufactures or in making manufacturing machinery, and 19,473 labourers employed in labour not agricultural. Of those engaged in manufactures, 550 were employed in stuff and carpet-making at Barnard Castle and in the city of Durham; about 500 were employed in the making of glass, especially glass bottles, at Gateshead, South Shields, Bishop's Wearmouth, Heworth, and Southwick; 350 in weaving linen and flax-dressing at Stockton and other places; 150 in iron works at Bedlington and at Bishop's Auckland; 150 in making engines, moulds, and patterns, chiefly at Birtley and Sunderland; 70 in woollen manufacture at [illegible] and Walsingham; the remainder were employed in the manufacture of earthenware, sailcloth, &c., at various places.

The following exhibits a summary of the population, taken at the last census, 1831, showing the number of the inhabitants and their occupations in each ward of the county:—

WARDS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			Males twenty years of age.
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other families not comprised in the two preceding classes.	Males.	Females.	Total.	
Chester Ward, three divisions . .	14,186	19,884	129	621	1,963	6,414	11,507	42,284	46,594	88,878	[illegible]
Darlington Ward, three divisions .	9,203	11,189	50	350	2,759	4,057	4,373	27,978	27,926	55,904	[illegible]
Easington Ward, two divisions . .	8,011	9,894	130	285	1,214	3,393	5,287	23,279	24,042	47,321	[illegible]
Stockton Ward, two divisions . .	4,402	4,841	13	127	1,559	1,579	1,703	10,856	11,829	22,685	[illegible]
Islandshire . .	1,209	1,451	4	69	347	356	748	3,814	4,369	8,183	[illegible]
Norhamshire . .	697	728	10	39	355	150	223	1,811	1,933	3,744	[illegible]
Durham (city) .	1,288	2,271	5	30	203	1,180	888	4,547	5,588	10,135	[illegible]
Sunderland (town)	1,744	4,478	4	49	8	1,382	3,058	7,179	9,881	17,060	[illegible]
Totals . . .	40,740	54,736	345	1,570	8,408	18,511	27,817	121,748	132,162	253,910	[illegible]

The population of Durham, at each of the four enumerations, was—

	Males.	Females.	Total.	Inc. per cent.
1801	74,770	85,591	160,361	
1811	83,671	93,954	177,625	10·76
1821	99,100	108,573	207,673	16·91
1831	121,748	132,162	253,910	22·22

an increase between the first and last periods of 93,539 persons, or 58½ per cent., which is 2½ per cent. beyond the general rate of increase throughout England.

County Expenses, Crime, &c.—The sums expended for the relief of the poor at the four dates of—

1801	were £51,966,	which was	6*s.* 5*d.*	for each inhabitant.
1811	„ 81,752	„ „	9*s.* 2*d.*	
1821	„ 91,182	„ „	8*s.* 9*d.*	
1831	„ 81,862	„ „	6*s.* 5*d.*	

The sum expended for the same purpose in the year ending the 25th March, 1836, was 65,392*l.*; and if it be assumed that the population has increased at the same rate of increase since 1831 as in the ten preceding years, the above sum gives an average of not quite 4*s.* 8*d.* for each inhabitant. All these averages are below those for the whole of England and Wales.

The sum raised in Durham for poor's-rates, county-rate, and other local purposes, in the year ending 25th March, 1833, was 104,707*l.* 15*s.*, and was levied upon the various descriptions of property as follows:—

On land	£64,467	10
„ dwelling-houses . .	22,950	5
„ mills, factories, &c. . .	7,508	10
„ manorial profits, navigation, &c.	9,781	10

The amount expended was—

For the relief of the poor . .	81,213	7
In suits of law, removal of paupers, &c.	4,360	1
For other purposes . . .	18,601	16
	£104,165	4

In the returns made up for the subsequent years the descriptions of property assessed for local purposes are not distinguished: the sums raised in the years ending 25th March, 1834, 1835, and 1836, were 107,648*l.* 4*s.*, 96,491*l.* 1*s.*, and 87,972*l.* 1*s.* respectively. The expenditure was as follows:—

	1834.		1835.		1836.	
	£.	s.	£.	s.	£.	s.
For the relief of the poor . . .	79,398	16	72,197	2	65,391	10
In suits of law, removals, &c. . .	5,245	3	4,221	4	3,735	0
Payment towards the county-rate	20,391	18	9,107	16	7,614	10
For all other purposes . . .			9,167	8	8,345	0
Total money expended . .	105,035	17	94,693*	6	85,086	0

The saving effected in the whole sum expended in 1836, as compared with the expenditure of 1834, is therefore 19,949*l.* 17*s.*, or nearly 19 per cent.; and the saving in the cost for the relief of the poor is 14,007*l.* 6*s.*, or rather more than 17½ per cent.

The county expenditure in 1834, exclusive of that for the relief for the poor, was 8,938*l.* 2*s.* 5*d.*, disbursed as follows:—

	£.	s.	d.
Bridges, buildings, and repairs, &c. .	1,646	4	6
Gaols, houses of correction, &c., and maintaining prisoners, &c. .	2,979	8	4
Lunatic asylums . . .	157	13	11
Prosecutions . . .	2,029	6	8
Clerk of the peace . . .	506	5	6
Conveyance of prisoners before trial .	683	1	3
„ of transports . .	52	12	0
Constables—high and special .	5	6	6
Coroner	143	12	0
Miscellaneous . . .	453	2	8½

The number of persons charged with criminal offences in the three septennial periods ending with 1820, 1827, and 1834, were 452, 688, and 1010 respectively; making an average of 64 annually in the first period, of 98 in the second, and of 144 in the third. The number of persons tried at quarter-sessions in each of the years 1831, 1832, and 1833, in respect to which any costs were paid out of the county-rates, were 63, 73, and 91. Among the persons charged with offences, there were committed for—

	1831.	1832.	1833.
Felonies . . .	60	50	78
Misdemeanors . .	13	23	13

The total number of committals in each of the same years was 124, 198, and 168, respectively; of whom

	1831.	1832.	1833.
The number convicted was .	91	119	92
„ acquitted .	6	57	27
Discharged by proclamation	27	22	49

The number of persons charged with offences in 1836 was 164; of these 105 were convicted and 59 acquitted, or no bills found against them. Of the 105 convicted, 6 were sentenced to death, which sentence was commuted to transportation; besides these there were 16 transported; 7 were imprisoned for 1 year, and above 6 months; and 75 for 6 months and under; and 1 was fined. Of the offences committed, 28 were against the person, 11 of which were for common assaults; 12 were offences against property committed with violence; 107 offences against property committed without violence; 7 for malicious offences against property; and 10 for riot or misdemeanor. Of the offenders 134 were males and 30 females. Among the whole number only 3 had received superior instruction, 83 could read and write imperfectly, 64 could neither read nor write, and the degree of instruction of the remaining 14 could not be ascertained. The proportion of offenders to the population in 1836 was 1 in 1720.

The number of turnpike trusts in Durham, as ascertained in 1834, was 19; the number of miles of road under their charge was 249; the annual income arising from the tolls and parish composition was 38,199*l.* 11*s.* 10*d.*, and the annual expenditure 36,614*l.* 2*s.* 11*d.*

The number of persons qualified to vote for county members in Durham (in 1836) were 5208 in the northern division, and 4864 in the southern division, being 1 in 28 of the whole population, and 2 in 13 of the male population above 20 years of age. The expenses of the last election of county members to parliament were to the inhabitants of the county 259*l.* 9*s.* 4*d.*, and were paid out of the general county-rate.

There are 8 savings'-banks in this county. The number of depositors, and amount of deposits on the 20th November, were respectively in—

	1832.	1833.	1834.	1835.
Number of depositors	3,356	3,584	3,691	4,013
Amount of deposits .	£109,352	114,436	115,678	122,109

The various sums placed in the savings'-banks in 1834 and 1835 were distributed as follows:—

		1834.		1835.	
		Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding	£20	1,844	£14,736	1,965	£15,557
„	50	1,163	35,750	1,324	40,065
„	100	457	31,796	492	33,031
„	150	135	16,237	147	17,509
„	200	71	11,862	68	11,325
Above	200	21	5,297	17	4,622
Total . .		3,691	£115,678	4,013	£122,109

Education.—The following summary is taken from the parliamentary inquiry on education made in 1835:—

	Schools.	Scholars.	Total.
Infant Schools	18		
Number of infants at such schools; ages from 2 to 7 years:—			
Males . . .		222	
Females . .		264	
Sex not specified		330	
			816
Daily Schools	769		
Number of children at such schools; ages from 4 to 14 years:—			
Males . . .		15,142	
Females . .		11,370	
Sex not specified		3,328	
			29,849
Schools . .	787		
Total of children under daily instruction .			30,656
Sunday Schools	260		
Number of children at such schools, ages from 4 to 15 and 16 years:—			
Males		11,095	
Females . . .		9,862	
Sex not specified		3,486	
			24,443

Assuming that there was the same rate of increase from 1831 in the population of the county as in the ten preceding years, and that the portion of it between the ages of two and 16 bore the same ratio to the whole as it did in 1821, there were living in Durham about 90,245 persons between those ages in 1834. Only two Sunday-schools are returned from places where no other schools exist: with this trifling exception, Sunday-school children have opportunity of resorting to daily schools also; but in what number or in what proportion duplicate entry is thus produced must remain uncertain. Forty-seven schools, containing 4145 children, which are both daily and Sunday-schools, are returned from various places, and duplicate entry is therefore known to have been thus far created. Making allowances for these imperfect data, we may conclude that, perhaps, not half of the children between the ages of 2 and 15 were receiving the benefit of instruction at the time the inquiry was made.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription.		By payments from scholars.		Subscrip. and payment from scholars.	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	..	..	3	214	10	232	5	370
Daily Schools	77	3151	25	1,649	620	20,482	47	4558
Sunday Schools	10	856	225	21,288	2	104	23	2195
Total...	87	4007	253	23,151	632	20,818	75	7123

The schools established by Dissenters, included in the above statement, are—

	Schools.	Scholars.
Infant schools	1	40
Daily „	11	510
Sunday „	83	10,312

The schools established since 1818 are—

Infant and other daily schools	365	14,841
Sunday-schools	184	17,208

Twenty-six boarding-schools are included in the number of daily schools as given above. No school in this county appears to be exclusively confined to any particular denomination of Christians, such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists, together with schools for children of Roman Catholic parents.

Lending libraries of books are attached to 52 schools in this county.

DURHAM, a city and borough, the capital of the county palatine of Durham, 67 miles east-south-east from Carlisle, 67 west-north-west from York, and 259 north-by-west from London.

We have no evidence of any town having existed where Durham now stands before the end of the tenth century, when the monks of Lindisfarne, or Holy Island, rested there with the remains of St. Cuthbert. According to the legend, when they arrived at Dunholme, the car, in which the saint's body was carried, by some miraculous interposition, became immovable, and the monks proceeded to build a sort of tabernacle wherein they deposited the relics; but soon after a stone church was built by Bishop Aldun, and dedicated to St. Cuthbert, whose remains were removed, and enshrined in it. The town of Dunholme, or Durham, was besieged by Duncan of Scotland in 1040; but was so well fortified and defended, that, after several fruitless assaults on the part of the assailants, the besieged made a successful sally and completely routed the enemy. By Leland it is called Duresme (the Norman name, whence Durham). 'The towne self of Duresme,' says Leland, 'stondith on a rocky hille; and stondith as men cum from the south cuntre on the ripe of Were, the which water so with his course naturall in a botom windeth about, that from Elvet, a great stone bridge of 14 arches, it crepeth about the towne to Trainegate bridge of 3 arches, also on Were, that betwixt these two bridges, or a little lower at St. Nicholas, the towne, except the length of an arrowshot, is brought in insulam.'

In 1069, Robert Cumin was appointed governor by William the Conqueror; but, in consequence of the excesses committed by the Norman soldiers under his command, the inhabitants set fire to his house, and murdered the whole garrison, with the exception of one man who escaped. William, greedy of revenge, marched an army northward, and the terrified inhabitants fled from the city; the monks retired to Holy Island; but when tranquillity was restored, they again returned to Durham with their sacred relics, which they had carried with them. In 1072 a strong castle was built here, and Walcher, a Norman, was appointed to the bishoprick. This prelate purchased the earldom of Northumberland, and assumed the title of Count Palatine. In 1093 the old church built by Aldun was pulled down, and the present magnificent edifice begun by King Mal- [illegible] Carilepho the bishop, and Turgot the prior. Dur- [illegible]s often the head-quarters of Edward III., and [illegible] monarchs and commanders on their excursions against Scotland. After the battle of Newburn, the city of Durham became almost depopulated.

By the 6th and 7th Will. IV., chap. 19, the whole of the palatine jurisdiction of the bishops of Durham is taken away, and is vested in the crown as a separate franchise and royalty. Before the passing of that act, the bishop of Durham, as count palatine and earl of Sadberg, was custos rotulorum of the county; he presided at the assizes, with his Majesty's judges, and the sheriff was accountable to him, and not to the king.

The city sends two members to parliament. The first charter was granted by Hugh Percy, and was confirmed by Pope Alexander; the governing charter is that of Bishop Egerton, dated 1780. The limits of the parliamentary borough have been extended by the Reform and Boundary Acts, and now include part of the township of Crossgate, part of the parish of St. Giles, part of the township of Elnet, the whole of St. Mary-le-Bow, and the whole of St Mary-the-Less. There are now three wards, six aldermen, and eighteen councillors. The revenue of the corporation is small, but they have no debt.

The corporation hold a court-leet and a court-baron as lessees of the bishop, for the recovery of debts under 40s. The court of the county of Durham (not the ordinary county court) was abolished by the 6th and 7th Will. IV., c. 19. The assizes for the county are held here twice a-year by the judges going the northern circuit.

The city is nearly surrounded by the river Wear, and, as Leland remarks, forms a peninsula, the centre of which rises to a lofty eminence, partially enclosed by the antient walls, and skirted with hanging gardens descending to the river, on each side of which are delightful public walks called The Banks. The cathedral and castle crown the summit. [CHURCH.]

At the northern extremity of the city is Framwell-gate bridge, erected about the year 1120 by Bishop Flambard. Elvet bridge, which crosses the river opposite Framwell-gate bridge, was originally built by Bishop Pudsey, in 1170, but it has lately been considerably widened and improved. A handsome bridge, consisting of three arches, was erected in the end of the last century at the extremity of the South Bailey.

The castle, which forms the occasional residence of the bishops of Durham, is supposed to have been built by William the Conqueror. The north gateway was till lately, when a new gaol, county courts, and house of correction were erected at an expense of nearly 120,000*l.*, used as a county gaol. In the market-place is the guildhall, erected by Bishop Tunstall in 1555; and on the Palace Green is the exchequer, containing offices for the auditor, cursitor, prothonotary, treasurer, registrar, &c.

The town is lighted with gas, and well paved. A public fountain stands in the centre of the market-place; the water is conveyed to the reservoir through pipes from a spring granted to the city for ever in 1450, by Thomas Bellingham, Esq. There is a theatre, as well as a subscription library, news-room, and assembly-rooms. Races are held here in May. The population of Durham in 1831 was 9269. There were 806 voters registered in 1832, the first registration after the Reform Act.

The trade of Durham was formerly much more considerable than it is at present. There are manufactories of stuffs and carpets, for spinning and combing wool, and for making hats, a brass-foundry, and two iron-foundries. A market for corn and other provisions is held on Saturday. There are fairs for cattle and horses on the 29th, 30th, and 31st of March, on Whit Tuesday, on the Saturday before the 13th of May, on September 15th, and on the Saturday before the 23rd of November. The March fair is very celebrated for its horses.

The city comprises six parishes: St. Giles, St. Margaret, St. Mary-le-Bow, St. Mary (in South Bailey), St. Nicholas, and St. Oswald, the livings of which are respectively of the clear annual value of 99*l.*, 409*l.*, 111*l.*, 119*l.*, 87*l.*, [illegible] There are places of worship for Quakers, Independents, Primitive and Wesleyan Methodists, and Roman Catholics. A mechanics' institute was established in 1825. There is a grammar-school connected with the cathedral which has four exhibitions for the sons of clergymen, of 25*l.* each at the school, and of 50*l.* each at either of the universities. It has also five scholarships of 10*l.* per annum each at Peter House, Cambridge, founded by Bishop Cosins, and one scholarship of 16*l.* per annum at Emanuel College, Cam bridge, jointly with the school at Newcastle-upon-Tyne. There are about 60 boys educated at the school, exclusive of 18 on the foundation. There is a blue-coat and Sunday school, as well as infant schools and a charity-school in Gravel-lane. It is said that upwards of 1000 children are gratuitously educated in Durham and its suburbs. An infirmary, erected in 1791, is supported by voluntary contributions. On Palace Green are almshouses for four poor men and four poor women, who receive an annuity of 70*l.* In addition to the charitable institutions mentioned, there is a numerous list of benefactors to the poor of the city and its vicinity.

About three-quarters of a mile from Durham is the site of the Maiden Castle, a fortress ascribed to the Romans, as also some remains of the Iknield-street. Saline, chalybeate, and sulphureous springs are found in the neighbourhood.

DURHAM CATHEDRAL. A plan of the cathedral of Durham has been already given under CHURCH, with its general dimensions of length, breadth, and height. It was begun during the reign of William Rufus by Bishop William de Carilepho, and continued, if not quite finished, by his successor Ranulf Flambard, who had shown his talent for architecture, before his promotion to the see of Durham, by the erection of the collegiate church of Christ Church, in Hampshire.

The cathedral erected by these prelates was of the form universally adopted by the Norman architects: a long cross, with two turrets at the west end, and between them a large and richly-ornamented arched door of entrance. The eastern end probably terminated in a semicircular form, as the lines of union of the original work with the Chapel of the Nine Altars strongly indicate. The side aisles, both of the nave and choir, were vaulted with semicircular arches groined; but the nave and choir were open to the timber roof. Such was the form of the edifice as left by the first architects.

The first addition to the original church was the Galilee, or Western Chapel, built by Bishop Hugh de Pudsey, between 1153 and 1195. The nave was vaulted by Prior Thomas Melsonby, who acceded in 1233, to whom also some ascribe the projecting of the great or central tower and the beginning of the building of the Chapel of the Nine Altars. These great works were finished by Richard Hotoun, who became prior in 1290, and who is recorded to have vaulted the choir. The great west window was inserted by prior John Fossour about the year 1350. The altar-screen, erected chiefly at the expense of John Lord Neville, was finished in 1380 by prior Robert Berrington.

The successive additions to this cathedral have rendered the church, as it now stands, not only a perfect specimen of the Norman architecture, but a most instructive series of examples, illustrating the gradual changes of the English style to the beginning of the fifteenth century. (Hutchinson's and Surtees's *Histories of Durham*, with the *Account of the Cathedral* written for the Society of Antiquaries by Sir H. C. Englefield, fol. Lond. 1801.)

DURHAM UNIVERSITY. The first attempt to establish a university at Durham was made during the time of the Commonwealth and the Protectorate of Cromwell. It originated in 1649, after the passing of the act for the abolition of deans and chapters, but was not carried into effect till May 15th, 1657, when letters patent were granted, by which the houses late belonging to the dean and prebendaries were converted into a university to be called by the name of 'The Mentor, or Provost, Fellows, and Scholars of the College of Durham, of the foundation of Oliver, Lord Protector of the Commonwealth of England, Scotland, and Ireland,' &c. By the same letters patent rent-charges to the annual amount of 900*l.* were assigned for the support of the persons belonging to the foundation, and leave was given them to purchase and enjoy lands and revenues to the amount of 6000*l.* a year. They were also to take the manuscripts, library books, mathematical instruments, &c. late belonging to the dean and chapter. The college however was never completely settled: at the Restoration the dean and chapter resumed their lands, and this foundation totally disappeared. (Pennant's *Tour in Scotland and the Hebrides*, 1772, vol. ii., p. 336; Surtees's *Hist. of the County Palat. of Durham*, vol. i., p. 106.) Oxford and Cambridge petitioned Richard Cromwell, when protector, against the power which his father had given to the university of Durham to grant degrees *pari passu* with them.

The following is the history of the university more recently established in this city.

The dean and chapter of Durham, by an act of chapter bearing date the 28th of April, 1831, have established an academical institution in that city in connexion with their cathedral church, which by an act of parliament passed in the 2nd and 3rd years of William IV., entituled 'An Act to enable the Dean and Chapter of Durham to appropriate part of the property of their Church to the establishment of a University in connexion there with, for the advancement of learning,' became confirmed and endowed. By this act the government of the university was vested in the said dean and chapter for the time being, subject to the jurisdiction of the bishop of Durham for the time being as visitor, and the establishment was to consist of a warden or principal, of certain professors and readers, tutors, students, and other officers and persons. By this act also certain lands, tenements, and hereditaments comprised in the leases mentioned in the schedule to the said act annexed, and the inheritance thereof in fee simple (subject to the said leases for years, and saving to the dean and chapter of Durham and their successors all mines, &c. opened and to be opened within and under the said lands), are vested in the dean and chapter of Durham and their successors for ever, in trust to apply the rents, fines, and other profits and proceeds of the said lands, for the maintenance and establishment of a university in connexion with the cathedral church of Durham. The leases mentioned in the schedule (the great majority of which are of dwelling-houses) amount to 394. The act empowers the dean and chapter, with the consent of the bishop of Durham, to sell all the lands and tenements mentioned in the said schedule, and also all other lands and tenements which shall at any time be vested in the dean and chapter of Durham in trust for the university. The purchasers of any of the lands and tenements so sold are to pay the purchase-money into the bank of England, in the name and with the privity of the accountant-general of the court of chancery, to be placed to his account there, '*ex parte* the Dean and Chapter of Durham, the University of Durham account.' The fifth section of the act provides for the application of the said purchase-monies. The fifteenth section enacts 'That it shall be lawful for any person or persons whatsoever, having any power to make an absolute disposition thereof, to give, convey, or assure, by any deed or deeds, any messuages, lands, tenements, or other hereditaments, or any estate or interest therein or thereout, or any monies, chattels, or effects, to the said Dean and Chapter of Durham and their successors, in trust for such University as aforesaid, or for any Professor, Reader, or other person or persons holding office therein or connected therewith; any law, statute, or custom to the contrary in anywise notwithstanding.' By another act of chapter, dated April 4th, 1834, it was directed that under the bishop as visitor, and the dean and chapter as governors, the affairs of this university should be managed by the warden and a senate and convocation: the senate to transact the ordinary business of the university and be competent to originate regulations and other measures relating to it, but such regulations and other measures not to be in force until confirmed by the convocation; the convocation to confirm or reject what is submitted to it by the senate, but to have no power to originate or amend.

This university is allowed to grant degrees in the several faculties, which are conferred by the warden and convocation, but the grace for a degree must be allowed by the dean and chapter before it is proposed in convocation. The academical year at Durham consists of three terms, of not less than eight weeks each, called respectively Michaelmas, Epiphany, and Easter terms; Michaelmas term not commencing earlier than the 10th October, and Easter term not ending later than 30th June. For the degree of B.A. the petitioner must be a student of the standing of twelve terms from his admission, and have kept nine terms at least by residence. For the degree of M.A., he must be of the standing of nine terms at least from the taking of his B.A. degree. A petitioner for the degree of B.D. must be of the standing of twenty-one terms from his admission as M.A. and a D.D. of thirty-three terms from the same. A petitioner for the degree of B.C.L. must be of the standing of twenty-one terms at least from the date of his matriculation: and no grace for the degree of D.C.L. can be granted unless the petitioner is a B.C.L. of thirty-three terms' standing. No grace for M.D. is granted unless the petitioner is a Bachelor of Medicine of the standing of nine terms at least from the date of his admission to that degree. This university has also the power to grant Honorary Degrees. For the detail of the exercises requisite for proceeding to the different degrees the reader is referred to the *Statute enacted by the Dean and Chapter*, with the *Regulations passed under its authority by the Senate and Convocation of the University*, 8vo. Durham, 1836.

In addition to the existing college, and any other establishment which may hereafter be founded by statute, halls and houses may be opened for the reception of students by licence, and under regulations from the warden and senate.

During the present year (1837) a royal charter has been granted to the university of Durham, which was formally received by that body in the month of June, 1837, and at the same time various gentlemen were admitted to the degree of B.A. The terms of the charter are not yet (June, 1837) made public.

DU'RIO, a genus of which the name has been derived from *durion* or *doorean*, a well-known fruit of the Malayan Archipelago. The specific name of *zibethinus* has been applied to the tree which forms this genus, from the fondness of the Malayan Zibet (*Viverra Rasse*, Hors.) for this fruit.

The genus Durio belongs to the natural family of Bombaceæ, considered by some botanists to be only a tribe of Sterculiaceæ. It is characterized by having its five petals smaller than the five lobes of the calyx. The stamens, long and numerous, are arranged in five bundles, and have twisted anthers; the free germen is surmounted by a long filiform style and capitate stigma; the fruit, roundish and muricated, is divided internally into five cells, and easily separates when ripe into five parts; each cell contains from two to four or five seeds enveloped in soft pulp.

Durio zibethinus is a large and lofty tree, with alternate leaves, which are small in proportion to its size; in form they resemble those of the cherry, or are oblong-pointed, small and green above, like nutmeg-tree leaves, but on the under surface are covered with orbicular reddish-coloured scales, as some species of Capparis; the petioles are tumid, and furnished with a pit towards their base; the flowers are arranged in clusters on the trunk and older branches, where of course is also borne the fruit, as in the Jack and Cocoa trees.

The Durion is a favourite food of the natives during the time (May and June) when it is in season; but there is usually also a second crop in November. It is as remarkable for the delicacy combined with richness of its flavour, as for the intolerable offensiveness of its odour, which is compared by Rumph to that of onions in a state of putrefaction, on which account it is seldom relished by strangers, though highly esteemed by many European residents. In size it is equal to a melon, or a man's head, and sometimes compared to a rolled-up hedge-hog (hence it has been called *echinus arboreus*) in consequence of its hard and thick rind, which is yellow-coloured when ripe, being covered with firm and angular projections. From this appearance has likewise been derived its Malayan name, *dury* in that language signifying a thorn or prickle. (Rumph.)

The seed, with its edible enveloping pulp, is about the size of a hen's egg; the latter is as white as milk, and as delicate in taste as the finest cream, and should be eaten fresh, as it soon becomes discoloured, and undergoes decomposition. Excessive indulgence in this, as in other fruits, is apt to create sickness, and therefore to its abundance has been sometimes ascribed the unhealthiness of some years; but as the crop of fruit is most abundant when the rains are very heavy and follow great heats, the sickness is probably due as much to the peculiarities of the season as to the too free use of this fruit.

The seeds of the Durion are likewise eaten when roasted, and have something of the flavour of chestnuts. The wood of the tree is valued for many economical purposes, especially when protected from moisture. The rind of the fruit is likewise turned to account by the industrious Chinese, as its ashes, when burnt, from probably containing potash, are used by them in the preparation of some dyes.

Marsden, in his account of Sumatra, quotes a celebrated [illegible] as saying that 'Nature seems to have taken a plea[illegible]ssembling in the Malay islands her most favourite productions.' Among these may be enumerated the Mangosteen, the Jack and Bread-fruit trees, the Lanseh and Durion, with others which are common in other tropical parts. These it has not been possible to cultivate in the hot-houses of England, even with all the skill of its horticulturists; a circumstance which must be ascribed partly to the great size of the trees, and partly to the peculiarity of climate of 'India aquosa,' as this part of the world was called by old writers. But as it is only within a few years that moisture has been combined with heat in the present successful cultivation of Orchideous plants, it might perhaps be possible to make some of the above fruits grow in a similar artificial climate; and by grafting, to make them bear when only a few feet high, as has been done with the Mango in India.

DURLACH, a circle of the province of the Middle Rhine, in the northern part of the grand duchy of Baden. It contains one town, two market-villages, eight villages, four hamlets, and about 24,200 inhabitants, of whom about 18,500 are Protestants, 5200 Roman Catholics, and the Jews, &c.

DURLACH, the chief town, is situated on the Pfinz, at the foot of the Thurmberg, a richly-cultivated hill, about four miles south-east of Carlsruhe, the road to which is formed by a straight avenue of Lombardy poplars: in 4[illegible] N. lat., and 8° 25′ E. long. It is an old town, and was long the residence of the margraves of Baden-Durlach, one of whom, Charles William, built Carlsruhe, and removed the seat of government to that spot. The palace, called the Carlsburg, and its grounds, in the latter of which are four stone columns once set up on the road through the land of the Decumates, in the reigns of Caracalla, Heliogabalus, and Alexander Severus, as well as an altar to Hercules, and several stone tablets with Roman inscriptions upon them, are the chief attraction of the place. It has a church, a seminary for teachers, and a town-hall, eight main streets, about 510 houses, and a population of about 4600. Trade, agriculture, and horticulture, the manufacture of wine, and mechanical pursuits, form the chief occupations of the people. The environs are covered with orchards. There is a large manufactory of earthenware in the town; and it has one of the most extensive markets for grain in the grand duchy. The celebrated German mechanic, Von Reichenbach, was born here.

DURSLEY. [GLOUCESTERSHIRE.]

DUSSEK, JOHANN LUDWIG, a celebrated composer for and performer on the piano-forte, was born in Bohemia, in 1760. His education in the university of Prague was most liberal, and music forming a part of it, he adopted that art as a profession. Dussek came to London about the year 1790, immediately distinguished himself, and might have realized an ample fortune had his industry and discretion borne any proportion to his talents. In 1800 he quitted England, and two years after became part of the household, and also the intimate and confidential friend, of Prince Louis Ferdinand of Prussia, who died so bravely at Saalfield in 1806. He then entered into the service of Prince Talleyrand, in which he continued till his death in 1812. 'His compositions,' says the Harmonicon, 'which reach Op. 77, are unequal, because many of them were produced by contract, therefore adapted to the capacity and taste of the mob of players; but we know scarcely any composer of piano-forte music who has given to the world so many things that are both good and popular at the same time.'

DÜSSELDORF, a county or administrative circle in the Prussian Rhenish province of Juliers-Cleves-Berg, traversed from south to north by the Rhine, and bounded on the north by Holland, on the east by the circle of Münster and Arnsberg, on the south by Cologne, and on the west by Holland and the circle of Achen or Aix-la-Chapelle. It has an area of about 2106 square miles, contains 13 minor circles and 58 towns, among which are Düsseldorf, Cleves (about 7100 inhabitants), Wesel (9950), Duisburg (5[illegible]), Emmerich (5760), Mühlheim (7000), Geldern (36[illegible]), Kempen (3250), Krefeld (19,300), Ratingen (3950), Barmen (25,100), Elberfeld (24,100), Lennep (4700), Burscheid (9960), Höhescheid (5300), Dorp (4900), Solingen (45[illegible]), Neuss (8100), and Viersen (3750). The present number of the inhabitants of Düsseldorf is about 722,300: in 18[illegible] it was 587,278; 1821, 613,811; and 1831, 694,727. It is the most densely peopled portion of the Prussian dominions. About two-thirds of the inhabitants are Roman Catholics.

and one-third Protestants. The number of villages is 410, and of hamlets 805. The Rhine enters this county near Rheinfeld, divides it into two nearly equal portions, and after receiving a multitude of rivers and small streams, quits it near Schenkenschanz, where it is 2300 feet in width. During its passage through Düsseldorf it is joined on the left bank by the Erft and Mörs, or Meurs, and on the right bank by the Wipper, Dühne, Düssel, Schwarzbach, Angerbach, Ruhr, Emsche, and Lippe. The northern part of the county is level, and though it contains large tracts of sand, it has also a considerable extent of good arable land and pastures. The soil of the other parts is highly productive in general, but there are many tracts in the mountainous districts, on the right bank of the Rhine, which are sterile, particularly in the circle of Lennep; and there are considerable woods and forests in and near those districts, to the extent of about 303,000 acres. The quantity of arable land is computed at 680,000 acres, and of meadows and pastures at 155,000 acres. There are extensive manufactures of woollen yarns and woollens, silks, cotton yarns and cottons, thread, leather, steel, iron, ironware and cutlery, tobacco, soap, &c. Iron, coals, and potters' clay, are among the native products. Grazing and the rearing of horses and cattle are actively pursued; the stocks in 1831 consisted of 34,973 horses, 154,313 horned beasts, and 77,032 sheep and goats.

DÜSSELDORF, a minor circle in the south of the preceding county or administrative circle, containing about 160 square miles and 64,600 inhabitants, with 4 towns, 37 villages, and 41 hamlets: it is bordered on the west by the Rhine, along which runs a range of small sand-hills; and is partly level and partly hilly. Its products are corn, potatoes, peas and beans, and much fruit; horned cattle, sheep, and swine are reared in great numbers. It is divided into 10 'Bürgermeistereien,' or townships, at the head of which is that of Düsseldorf (village of the Düssel), the capital of the whole county, formerly that of the duchy of Berg.

DÜSSELDORF, the capital, is situated in the centre of a fertile country on the right bank of the Rhine, at the point where the Düssel joins that river, in 50° 13′ N. lat. and 6° 47′ E. long., at an elevation of about 100 feet above the level of the sea. It was raised from the rank of a village ('villa') to that of a municipal town by Adolphus V., duke of Berg, in 1288: it was first united to the Prussian dominions with the duchy of Berg in 1815. The flying bridge across the Rhine dates from the year 1680. Düsseldorf having been carefully fortified, acquired the character of a fortress in the middle of the last century; but it was never tenable against a serious assault, and the defences were razed by virtue of the treaty of Luneville in 1802. It is one of the best-built towns on the Rhine, is surrounded by extensive garden-grounds, and consists of three quarters; namely, the Old Town on the right bank of the Düssel, which was the whole extent of the town until the beginning of the 17th century; the New Town on the Rhine; and Charles's Town (Carlstadt), the handsomest part of Düsseldorf, south of the Old Town and on the left bank of the Düssel, which takes its name from Charles Theodore, the elector-palatine, who founded it in 1786. There are 43 streets, several of which are constructed on a regular plan, particularly Frederic William's street which is planted with rows of trees, and five squares or open spaces, on one of which, the old market-place, stands an equestrian statue in bronze of John William, elector-palatine, of colossal dimensions but heavy execution, the work of Crepello. Among the buildings of note are the old palace, or rather one of its wings, (the only portion that escaped entire destruction during the bombardment of the town by the French in 1794), which has latterly been restored for the use of the Academy of Arts and the Royal Mint, and in the court-yard of which is another statue of John William by Crepello, in marble; adjacent thereto is the Picture Gallery, founded by that elector in 1710; but the 358 paintings it then contained were removed to Munich in 1808, and it now consists of 65 paintings, 263 sketches, 14,841 original drawings, 23,445 engravings, and 155 copper-plates. The other buildings of consequence are the present palace, where the governor or president of the county resides; the government-house, once a college of Jesuits; the observatory, town-hall (erected in 1567), courts of law, new barracks, theatre, public school or gymnasium, with about 320 pupils, a mint, and public library of about 30,000 volumes. Düsseldorf has seven churches, including two Protestant: the most remarkable are St. Lambert's, the high church, and the oldest in the town, which contains the sepultures of several dukes of Berg, &c., and the church of the Jesuits, a handsome structure with two steeples, but overloaded with ornaments, beneath the main altar of which other sovereigns of Düsseldorf lie entombed. Besides these, there are a synagogue, three nunneries, an orphan and a lunatic asylum, two hospitals, and an infirmary, a polytechnic school, and a Protestant seminary for teachers, ten elementary schools, and ten schools for poor children, supported by the directors of the poor, a house of correction, an obstetrical institution, &c. The number of houses is about 1430; in 1791 it was 852; and in 1825, 1103. The population amounted to 8208 in 1775; 9541 in 1791; 12,102 in 1801; 14,100 in 1816; 18,724 in 1827; and 20,578 in 1831. . The present population is about 21,000; and that of the whole township in 1834 was 31,109, of whom 25,833 were Roman Catholics. In 1833, the number of births was 1187, and of deaths 876. The marriages were in that year 260.

Düsseldorf is the seat of the provincial government, offices of revenue and taxes, and tribunals of justice, and possesses an academy of the fine arts and design with about 150 pupils, an architectural institute, an observatory, and several private collections in the fine arts, &c.; societies for the promotion of the useful arts, the improvement of prisons, &c., and a bible society, besides a variety of philanthropic associations. It has manufactories of woollens, cottons, leather, hats, tobacco, jewellery, mirrors, stockings, &c., and carries on a considerable trade in cotton, wool, wines and spirits, colonial produce, coals, timber, slates, and other commodities. It is a free port, and has a harbour for fifty vessels. Adjoining the town are the royal gardens, and a botanic garden.

DUTE'NS, LOUIS, was born at Tours, of a Protestant family, in 1730. After receiving his education in France, he came to England, and travelled with several noblemen in succession over the Continent, and also acted for a time as secretary to the English minister at the court of Turin. On his return to England he was presented to the living of Elsdon in Northumberland. He was made member of the Royal Society of London, and of the Académie des Inscriptions et Belles Lettres of Paris. Being well versed in antient and modern philology, and in archæology and numismatics, he wrote many works, the principal of which are:—'1. Recherches sur l'Origine des Découvertes attribuées aux Modernes, où l'on démontre que nos plus célèbres Philosophes ont puisé la plupart de leurs Connoissances dans les Ouvrages des Anciens, et que plusieurs vérités importantes sur la Religion ont eté connues des Sages du Paganisme,' 8vo., Paris, 1766. This work went through several editions, revised by the author, to the last of which, 1812, he added his 'Recherches sur le tems le plus reculé de l'usage des Voûtes,' which he had previously published separately. In his zeal to vindicate the often-overlooked claims of the antients to several discoveries which have been reproduced in modern times, Dutens oversteps at times the boundaries of sound criticism, and seems to wish to attribute almost every invention to the nations of antiquity. 2. 'Explication de quelques Médailles Grèques et Phéniciennes, avec une Paléographie Numismatique,' 4to., 1776, to which are added several previously-written dissertations on numismatics. 3. 'Itinéraire des Routes les plus fréquentées de l'Europe,' a work often reprinted. 4. 'Guide Moral, Physique, et Politique des Etrangers qui voyagent en Angleterre.' 5. 'Appel au Bon Sens,' a defence of Christianity against Voltaire and the Encyclopédistes. 6. 'Des Pierres précieuses et des Pierres fines, avec les Moyens de les connoître et de les évaluer,' Paris, 1776. 7. 'Histoire de ce qui s'est passé pour l'établissement d'une Régence en Angleterre,' 8vo., 1789. 8. Nouveaux Intérêts de l'Europe depuis la Révolution Française,' 1798. 9. 'Considérations Théologiques sur les Moyens de réunir toutes les Eglises Chrétiennes,' 8vo., 1798, a well meaning speculation towards a hopeless object. 10. 'Mémoires d'un Voyageur qui se repose,' 3 vols., 8vo., Paris, 1806, which contain anecdotes of Dutens's life and travels. Dutens died in England in 1812.

DUU'MVIRI, the name given to any magistrates in the republic of Rome who were elected in pairs for the discharge of any class of duties. The first duumvirate on record was composed of the two judges of blood (*duumviri perduellionis*), appointed by Tullus Hostilius for the trial of P. Horatius, a right of appeal to the people being allowed to the accused (Liv. i. 26). This office was exercised by Tarquinius Superbus alone, for tyrannical purposes (Liv. i. 49), and afterwards by the consuls (Liv. ii. 5), who were indeed a duumvirate. The *Quæsitores parricidii* were afterwards substituted for the consuls, and these were mentioned in the laws of the Twelve Tables (Pompon. l. ii. §. 23 D); but it seems that the duumviri were again entrusted with the administration of criminal law at the trial of Manlius Capitolinus (Gellius, xvii. 21); and they are mentioned as still existing even by Cicero (*Pro C. Rabirio*, c. iv. §. 12). The *duumviri sacrorum*, who took care of and interpreted the Sibylline Books, were also a very antient magistracy (Liv. iv. 21). Niebuhr thinks (*Hist. of Rome*, i., p. 298, Engl. Tr.) that the number was dictated by a wish to deal evenly with the first two tribes, the Ramnes and the Tities. The chief magistrates in the municipia were also called duumviri (*Lips. Elect.*, i. 23), or sometimes consuls. (Cicero, *in Pisonem*, c. xi.) Their lictors generally carried little staves (*bacilla*) before them; but they occasionally arrogated to themselves the fasces. (Cicero, *Agrar.* ii. 34.) The *duumviri navales* were two officers, first elected in the year 436 A.U.C. (Liv. *Epit.* lib. xii.; Niebuhr's, *Römische Geschichte*, th. iii. p. 282). Their duty was to collect, equip, man, and command the fleets of the republic (Liv. ix. 30; xl. 18 and 26). There were also other duumviri created for special occasions.

DWARF is a technical term employed by gardeners to distinguish fruit-trees whose branches proceed from close to the ground from *riders* or standards whose original stocks are several feet in height.

DWARFING TREES. Nature, in many respects, can be made to deviate from her ordinary course of procedure, in order to be subservient to the purposes of men. In nothing is this fact more apparent than in the various modes of dwarfing trees.

The trees of our orchards and forests, for example, which grow naturally to a considerable size, can be made to assume all the appearances of maturity and age while only a few feet high; a forest in miniature can thus be created, which has a very grotesque and curious appearance. There are various methods of producing this effect; such as selecting peculiar kinds of stocks and grafting upon them. For example, if the pear-tree be grafted upon the quince stock, or the peach upon the plum, their growth is very much retarded, and their ultimate size is comparatively small: the same effect is produced upon all other trees where there is a difference between the tissue of the stock and that of the scion which has been grafted upon it; or if dwarf varieties be grafted upon stocks of a similar constitution, though taller in growth, the former will still retain their original character. Again, if the branches be bent, and the flow of the sap in any way impeded, or if a quantity of the fibrous roots be cut away, and nourishment more sparingly supplied to the branches, we arrive at the same results.

Sometimes trees are dwarfed by very severe pruning, particularly if this operation be performed in summer, and, although they evidently try for a length of time to overcome this obstruction to their natural size, yet they eventually assume a dwarfed and stunted habit, which, with a little care, may be retained for many years. The Chinese in particular have carried this practice to a great extent, and they ornament their fanciful gardens with miniature forests of elms, junipers, and other timber trees.

The methods of dwarfing employed by the Chinese are the following:—young trees of various sorts are planted in flat porcelain vessels, and receive only so much water as is sufficient to keep them alive; in a very short time the pots are completely filled with roots, which, being hemmed in on all sides, cannot obtain a sufficient quantity of nutriment, and, as a matter of course, the growth of the stem and branches is thus impeded. The Chinese also pinch off the ends from the young shoots, mutilate the roots, lacerate the bark, tie down the branches, and break many of them half through; in short, by every means in their power they contrive to check growth, so that, stunted and deformed by these means, the trees soon assume all the marks of age when only two or three feet high.

There is another method of producing dwarf trees, which may be termed accidental: namely, selecting dwarf individuals and obtaining seed from them. It is well known that when the young seed is fertilized by the influence of the pollen belonging to its own flower, or to the same plant upon which it grows, the future progeny so produced partakes generally in a large degree of the nature of the parent from which it originates. Now, if seed be carefully obtained from a variety rather more dwarf than usual, some of the plants produced by that seed will be something dwarfer than their parents. The dwarfest individuals again selected for seed will originate a race yet dwarfer than themselves; and thus, with patience and by successive generations, a variety only a few inches high may be obtained from a species two or three feet high, or even higher. This is the origin of dwarf roses, sweet williams, dahlias, and other common cultivated flowers.

With the exception of this last-mentioned method, all the others, however different they may seem, proceed from the same principle; for whether we graft upon stocks whose tissue differs in organization from the scion, or whether we bend the branches, or cut or confine the roots, we prevent the full flow of the sap in all such cases, and thus advance the age of puberty and bring on a fruit-bearing state. When plants have arrived at this stage of existence, all their energies are directed to the formation of fruit; hence forcing a tree into an early state of fruit-bearing is almost synonymous with dwarfing it.

DWIGHT, TIMOTHY, an eminent American Presbyterian divine, was born at Northampton, in Massachusetts, May 14, 1752. From infancy he made rapid progress in general and scholastic learning; insomuch that, at the age of seventeen, very soon after taking the degree of B. A at Yale College, Newhaven, he was appointed master of a grammar-school in that town, and, before he was twenty, one of the tutors of Yale College. He was licensed to preach in 1777, in which year, the sessions of the college having been stopped by the war of the Revolution, he offered his services as a chaplain in the American army. The death of his father in the following year rendered it desirable that he should return to Northampton, and the rest of his life was principally occupied in discharging the duties of tuition, first as master of a private seminary, next as president of Yale College, to which office he was appointed in 1795. He also held the professorship of theology. He died January 11, 1817.

His early life was extremely laborious: it is stated that while he kept school at Newhaven his time was regularly divided:—six hours of each day in school, eight hours in close and severe study, and the remaining ten hours in exercise and sleep. (Life, p. 20.) Over-exertion nearly brought on blindness: from the age of twenty-three he was continually subject to acute pain behind the eyes, and was unable, for the space of forty years, to read longer than fifteen minutes in the day. This makes the extent and variety of his knowledge, which was acquired almost entirely through the ear, the more remarkable; and the mastery which he acquired over his mental powers by discipline was so complete, that he could dictate two or three letters to different amanuenses at once, and he seldom forgot or found difficulty in producing any fact which was once stored in his memory. In 1774 he resorted to a severe system of abstinence in food and exercise, which had nearly proved fatal. He recovered a vigorous state of health, chiefly by returning to a daily course of strong exercise, and the benefit thus derived led him in after-life to devote his recreations regularly to a series of excursions, of which we have the fruits in his 'Travels in New England and New York,' 4 vols., 8vo., 1823. These contain a great quantity of information, statistical, topographical, and historical, which, considering Dr. Dwight's mental habits and opportunities, there is every reason to presume accurate: the statistics of course have long ceased to represent the present condition of the country. The historical parts, especially those relating to the Indian history, manners, and warfare, are of much interest. Dr. Dwight's chief work however 'Theology explained and defended in a Series of Sermons,' 5 vols., 8vo. It is a course of 173 lectures, delivered by him as professor of divinity on the Sundays in term-time, so as to occupy about four years. His method of preaching was from very concise notes or heads, his eyes not permitting him to undergo the labour of writing; so that this voluminous body of divinity was not committed to paper till 1805, in which year he was provided with an amanuensis at the expense of the college.

Two more volumes of his sermons, fifty-nine in number, were published in 1827, and the editor intimates that he has more behind. These contain several addressed by him annually, according to college custom, as president, to the candidates for the degree of B.A., which will be read with interest. Dr. Dwight is said to have been eminently a useful and effective as well as a learned preacher, and his life bore witness to the efficacy of his own belief. (*Life, prefixed to his 'Theology Explained.'*)

DWINA, the largest river that falls into the White Sea, and the seventh with regard to length in the Russian dominions, originates in the confluence of two smaller rivers, the Sukhoria and Yug, near Veliki-Usstiug, in 60° 46′ N. lat., and 46° 30′ E. long. The Sukhoria, a considerable stream, which flows out of Lake Goubinskii or Kuban, and runs in a very tortuous direction through the south-western parts of the government of Vologda, describes a course, along the whole of which it is navigable, of about 285 miles between that lake and the junction with the Yug. The Yug, flowing down from a morass on the northern range of the Volga mountains, at the southernmost point of the same government, and in the early part of its course washing the walls of Nikolsk in its progress northwards to its confluence with the Sukhoria, has a length of about 248 miles. These two rivers unite below Veliki-Usstiug and the river is thenceforward denominated the Dwina. The Dwina pursues in general a north-westerly direction through the western districts of the government of Vologda, becomes navigable before it quits them, traverses the south-western part of the government of Archangel, and discharges its waters through five arms below the town of Archangel into the bay of Dwinskaya, in the White Sea. Its length in a straight line from its source to its mouth is about 312 miles, but, including its windings, it is estimated at about 736 miles. It is navigable from the close of April to the first week in November for a distance of about 240 miles. It generally flows between high banks, and is on an average from 500 to 600 feet in width; at Archangel this width is increased to four miles. Soon after it has received the Pinega on its right bank, it forms a number of islands, which extend to its mouth. Its chief tributaries are, on its right bank, the Vouitsheyda or Vitshayda, the source of which is on the declivity of the Vertshoturi range of the Ural mountains, not far from the sources of the Petshora: this river has numerous bends, and falls into the Dwina near Kershensko, in the centre of the government of Vologda, from which point the Dwina becomes navigable; and the Pinega, in the south-western part of the government of Archangel, which becomes navigable for a distance of about 70 miles from Pineg downwards, and after a course of about 190 miles, discharges its waters into the Dwina a little above the town of Kholmogory. On its left bank the Dwina receives the Vaga, which is navigable for about 75 miles, and joins the Dwina above Poinskoi, in the government of Archangel, and the Yamza, a river navigable for about 90 miles, which has its confluence with the Dwina about 36 miles above Vilsk in the same government. The tides of the Dwina are perceptible nearly 30 miles above Archangel. The basin of the river occupies an area of about 123,900 square miles; the bed is generally of clay, covered with a thin layer of sand. It abounds in fish.

DYEING is the art of staining textile substances with permanent colours. To cover their surfaces with colouring matters removable by abrasion would be to apply a pigment rather than to communicate a dye. Dye-stuffs can penetrate the minute pores of vegetable and animal fibres only when presented to them in a state of solution, and they can constitute fast colours only by passing afterwards into the state of insoluble compounds. Dyeing thus appears to be altogether a chemical process, and to require for its due explanation and practice an acquaintance with the properties of the elementary bodies, and the laws which regulate their combinations. It is true that many operations of this, as of other chemical arts, have been practised from the most antient times, long before any just views were entertained of the nature of the changes that took place. Mankind, equally in the rudest and most refined state, have always sought to gratify the love of distinction by staining their dress, sometimes even their skin, with gaudy colours. Moses speaks of raiment dyed blue, and purple, and scarlet, and of sheep-skins dyed red; circumstances which indicate no small degree of tinctorial skill. He enjoins purple stuffs for the works of the tabernacle and the vestments of the high priest.

In the article Calico Printing, we have shown from Pliny that the antient Egyptians cultivated that art with some degree of scientific precision, since they knew the use of mordants, or of those substances which, though they may impart no colour themselves, yet enable white robes (*candida vela*) to absorb colouring drugs (*colorem sorbentibus medicamentis*). Tyre, however, was the nation of antiquity which made dyeing its chief occupation and the staple of its commerce. There is little doubt that purple, the sacred symbol of royal and sacerdotal dignity, was a colour discovered in that city, and that it contributed to its opulence and grandeur. Homer marks the value as well as antiquity of this dye, by describing his heroes as arrayed in purple robes. Purple habits are mentioned among the presents made to Gideon by the Israelites from the spoils of the kings of Midian.

The juice employed for communicating this dye was obtained from two different kinds of shell-fish, described by Pliny under the names of *purpura* and *buccinum*; and was extracted from a small vessel, or sac, in their throats to the amount of only one drop from each animal. A darker and inferior colour was also procured by crushing the whole substance of the buccinum. A certain quantity of the juice collected from a vast number of shells being treated with sea-salt, was allowed to ripen for three days; after which it was diluted with five times its bulk of water, kept at a moderate heat for six days more, occasionally skimmed to separate the animal membranes, and when thus clarified was applied directly as a dye to white wool, previously prepared for this purpose by the action of lime-water, or of a species of lichen called fucus. Two operations were requisite to communicate the finest Tyrian purple; the first consisted in plunging the wool into the juice of the purpura; the second, into that of the buccinum. Fifty drachms of wool required one hundred of the former liquor, and two hundred of the latter. Sometimes a preliminary tint was given with coccus, the kermes of the present day, and the cloth received merely a finish from the precious animal juice. The colours, though probably not nearly so brilliant as those producible by our cochineal, seem to have been very durable, for Plutarch says, in his *Life of Alexander*, (chap. 36), that the Greeks found in the treasury of the king of Persia a large quantity of purple cloth, which was as beautiful as at first, though it was 190 years old.*

The difficulty of collecting the purple juice, and the tedious complication of the dyeing process, made the purple wool of Tyre so expensive at Rome that in the time of Augustus a pound of it cost nearly 30*l.* of our money.† Notwithstanding this enormous price, such was the wealth accumulated in that capital, that many of its leading citizens decorated themselves in purple attire, till the emperors arrogated to themselves the privilege of wearing purple, and prohibited its use to every other person. This prohibition operated so much to discourage this curious art as eventually to occasion its extinction, first in the western and then in the eastern empire, where, however, it existed in certain imperial manufactories till the eleventh century.

Dyeing was little cultivated in antient Greece; the people of Athens wore generally woollen dresses of the natural colour. But the Romans must have bestowed some pains upon this art. In the games of the circus parties were distinguished by colours. Four of these are described by Pliny, the green, the orange, the grey, and the white. The following ingredients were used by their dyers. A crude native alum mixed with copperas, copperas itself, blue vitriol, alkanet, lichen rocellus, or archil, broom, madder, woad, nut-galls, the seeds of pomegranate, and of an Egyptian acacia.

Gage, Cole, Plumier, Réaumur, and Duhamel have severally made researches concerning the colouring juices of shell-fish caught on various shores of the ocean, and have succeeded in forming a purple dye, but they found it much inferior to that furnished by other means. The juice of the buccinum is at first white; it becomes by exposure to air of a yellowish green bordering on blue; it afterwards reddens, and finally changes to a deep purple of considerable vivacity. These circumstances coincide with the minute description of the manner of catching the purple-dye shell-fish which we possess in the work of an eye-witness, Eudocia Macrembolitissa, daughter of the Emperor Constantine VIII., who lived in the eleventh century.

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* 'Among other things, there was purple of Hermione (?) to the amount of five thousand talents.' (Plutarch's Lives, translated by Langhorne, Wrangham's edition, vol. v., p. 240.) Horace celebrates the Laconian dye in the following lines:—

Nec Laconicas mihi
Trahunt honestæ purpuras clientæ.
(Carm., lib. ii., Ode 18.)

† Pliny says that a pound of the double-dipped Tyrian purple was sold in Rome for a hundred crowns.

The moderns have obtained from the New World several dye-drugs unknown to the antients; such as cochineal, quercitron, Brazil wood, logwood, annatto; and they have discovered the art of using indigo as a dye, which the Romans knew only as a pigment. But the vast superiority of our dyes over those of former times must be ascribed principally to the employment of pure alum and solution of tin as mordants, either alone or mixed with other bases; substances which give to our common dye-stuffs remarkable depth, durability, and lustre. Another improvement in dyeing of more recent date is the application to textile substances of metallic compounds, such as Prussian blue, chrome yellow, manganese brown, &c.

Indigo, the innoxious and beautiful product of an interesting tribe of tropical plants, which is adapted to form the most useful and substantial of all dyes, was actually denounced as a dangerous drug, and forbidden to be used, by our parliament in the reign of Queen Elizabeth. An act was passed authorizing searchers to burn both it and logwood in every dye-house where they could be found. This act remained in full force till the time of Charles II.; that is, for a great part of a century. A foreigner might have supposed that the legislators of England entertained such an affection for their native woad, with which their naked sires used to dye their skins in the old times, that they would allow no outlandish drug to come in competition with it. A most instructive book might be written illustrative of the evils inflicted upon arts, manufactures, and commerce, in consequence of the ignorance of the legislature.

Mr. Delaval made many ingenious experiments to prove that the particles of dye-stuffs possess no power of reflecting light, and that therefore when viewed upon a dark ground they all appear black, whatever colour they may exhibit when seen by light transmitted through them. He hence inferred that the difference of colour shown by dyed cloths is owing to the white light which is reflected from the textile fibres being decomposed in its passage through the superinduced colouring particles. We think it more than probable that this conclusion is in some respects incorrect, and that the aluminous, iron, and tin bases form combinations with dye-stuffs which are capable of reflecting light, independent of the reflection from the fibre itself. There can be no doubt however that this latter reflected light adds greatly to the brightness of the tints, and that the whiter the textile substance is the better dye it will, generally speaking, receive. It is for this reason that scouring or bleaching of the stuffs is usually prescribed as a process preliminary to dyeing.

Bergman appears to have been the first who referred to chemical affinities the phenomena of dyeing. Having plunged wool and silk into two separate vessels, containing solution of indigo in sulphuric acid diluted with a great deal of water, he observed that the wool abstracted much of the colouring matter, and took a deep blue tint, but that the silk was hardly changed. He ascribed this difference to the greater affinity subsisting between the particles of sulphate of indigo and wool, than between these and silk; and he showed that the affinity of the wool is sufficiently energetic to render the solution colourless by attracting the whole of the indigo, while that of the silk can separate only a little of it. He thence concluded that dyes owed both their permanence and their depth to the intensity of that attractive force.

We have therefore to consider in dyeing the play of affinities between the liquid medium in which the dye is dissolved and the fibrous substance to be dyed. When wool is plunged in a bath containing cochineal, tartar, and salt of tin, it readily assumes a beautiful scarlet hue, but when cotton is subjected to the same bath it receives only a feeble pink tinge. Dufay took a piece of cloth woven of woollen warp and cotton weft, and having exposed it to the fulling-mill in order that both kinds of fibres might receive the same treatment, he then subjected it to the scarlet dye; he found that the woollen threads became of a vivid red, while the cotton continued white. By studying these differences of affinity, and by varying the preparations and processes, with the same or different dye-stuffs, we may obtain an indefinite variety of colours of variable solidity and depth of shade.

Dye-stuffs, whether of vegetable or animal origin, though susceptible of solution in water, and, in this state, of penetrating the pores of fibrous bodies, seldom possess alone the power of fixing their particles so durably as to be capable of resisting the action of water, light, and air. For this purpose they require to be aided by another class of bodies, already alluded to, which bodies may not possess any colour in themselves, but serve in this case merely as a bond of union between the dye and the substance to be dyed. These bodies were supposed, in the infancy of the art, to seize the fibres by an agency analogous to that of the teeth of animals, and were hence called *mordants*, from the Latin verb *mordere*, to bite. However preposterous this comparison is now known to be, the term derived from it has gained such a footing in the language of the dyer that all writers upon his art are compelled to adopt it.

Mordants may be regarded, in general, as not only fixing but also occasionally modifying the dye, by forming with the colouring particles an insoluble compound, which is deposited within the textile fibres. Such dyes as are capable of passing from the soluble into the insoluble state, and of thus becoming permanent, without the addition of a mordant, have been called substantive, and all the others have been called adjective colours. Indigo and tannin are perhaps the only dyes of organic origin to which the title substantive can be applied, and even they probably are so altered by atmospheric oxygen, in their fixation upon stuffs, as to form no exception to the true theory of mordants.

Mordants are of primary importance in dyeing; they enable us to vary the colours almost indefinitely with the same dye, to increase their lustre, and to give them a durability which they otherwise could not possess. A mordant is not always a simple agent, but in the mixture of which it consists various compounds may be formed, so that the substances may not act directly, but through a series of transformations. The China blue process [CALICO PRINTING] affords a fine illustration of this truth. Sometimes the mordant is mixed with the colouring matters, sometimes it is applied by itself first of all to the stuff, and at others both these methods are conjoined. We may dye successively with liquors which contain different substances, which will act differently according to the different mordants successively employed. One solution will give up its base to the stuff only when aided by heat; another acts better and more uniformly when cold, though this is a rarer case.

When a mordant consists of a changeable metallic oxide, as of iron or tin, unless great nicety be used in its application, either no effect or an injurious one may be produced upon the dye. All these circumstances prove how necessary it is for the dyer to be thoroughly versed in chemical science. Each of the great dye-works in Alsace, celebrated for the beauty and fixity of their colours, is superintended in the laboratory department by a gentleman who has studied chemistry for two or more sessions in the universities of Paris or some other eminent schools. The numerous complaints which for some time back have been made in foreign markets of the fugitiveness of our calico, but especially of our cloth dyes, ought to rivet the attention of our great manufacturers and merchants on this important desideratum, and to lead them to supply it by consulting qualified persons as to the best means of improving this great branch of national industry.

The first principle of dyeing fast colours, we have seen, consists in causing the colouring matter to undergo such a change, when deposited upon the wool or other stuffs, as to become insoluble in the liquor of the dye-bath. The more powerfully it resists the action of other external agents, the more solid or durable is the dye. Generally speaking, a piece of well-dyed cloth should not be materially affected by hot water, by soap and water, by exposure to air and light, by dilute nitric acid, or even by very dilute aqueous chlorine.

In the following details concerning the art of dyeing we shall consider principally its application to wool and silk, having already treated, in the article CALICO PRINTING, of what is peculiar to cotton and linen.

The operations to which wool and silk are subjected preparatory to being dyed are intended, 1, to separate certain foreign matters from the animal fibre; 2, to render it more apt to unite with such colouring particles as the dyer wishes to fix upon it, as also to take therefrom a more lively and agreeable tint, as well as to be less liable to soil in use

The matters foreign to the fibre are either such as are naturally associated with it during its production by the animal, such as have been added to it in the spinning and weaving operations, or such as have been accidentally applied.

Silk is scoured by means of boiling in soap and water, whereby it is freed from a varnish improperly called gum. This consists of an azotized compound, which may be separated in a gelatinous form by cooling the hot water saturated with it. It constitutes about a fourth part of the weight of most raw silks, and contains a little colouring matter of an orange or yellow hue. When silk is required to be extremely white, either to be woven in that state, or to receive the brightest and purest dyes, it should be exposed to the action of humid sulphurous acid. [SULPHURATION.] For dark dyes, silk need not be scoured at all, in which case it preserves its whole weight. Wool is first washed in running water to separate its coarser impurities; it is then deprived of its *yolk* (a species of animal soap secreted from the skin of the sheep) either by the action of ammoniacal urine, by soap and water, or by a weak lye of carbonate of soda. Common wools lose in this way from 20 to 50 per cent. of their weight, and Merino wools still more. They receive their final bleaching by the fumes of burning sulphur, or by aqueous sulphurous acid.

Wools present remarkable differences in their aptitude of combining with dye-stuffs, which depend upon the different structure of the imbrications of the filaments. (Ure's *Philosophy of Manufactures*, p. 91.) The colouring particles seem to insinuate themselves at these pores with greater or less facility, and to be retained with greater or less force, according to the magnitude and form of the orifices. This difference in dyeing, therefore, is not due to the repulsive action of fatty matter, as has been commonly supposed, since it still exists in wool even when every particle of grease has been removed from it by alcohol and æther. A bran boil is often had recourse to, in order to make wool take the dye more readily and equally; but a hot lye containing one-half per cent. of crystallized carbonate of soda answers much better. When heated to the temperature of 140° or 150° Fahr., four parts of wool should be immersed in that liquor, and turned about for half an hour. The wool receives a faint yellowish tint from this bath, but it speedily becomes white on exposure to air, or it may be whitened at once by passing it through tepid water containing a very small quantity of muriatic acid. The yellow colour is most probably occasioned by the reaction of the sulphur and iron contained in the wool.

According to the experiments of Thenard and Roard, alum combines with wool in the state of a salt, without separation of its acid constituent. Wool boiled with a solution of tartar decomposes a portion of it completely; some of the acid and a little of the tartar combine with the wool, while a neutral tartrate of potash remains in the bath. This fact is interesting in reference to the scarlet dye, showing the important part which tartaric acid here performs.

Tinctorial colours are either simple or compound. The simple are black; brown, or dun; blue; yellow; and red; the compound are gray; purple; green; orange; and other numerous modifications, all producible by the mixture of simple colours. We shall treat here of only *black* and *brown*, to supply an omission in the previous part of the 'Cyclopædia.' The other dyes will be discussed in their alphabetical places.

Black.—If we apply to a white stuff blue, red, and yellow, in certain proportions, the resulting colour will be black. Proceeding on this principle, Father Castel asserted that 15 parts of blue, 5 of red, and 3 of yellow will produce a perfect black; but in making this statement he was influenced rather by theoretical than practical considerations. In fact he has afforded us no means of procuring these simple colours in an absolute state. It is undoubtedly true, however, that red, yellow, and blue, employed in adequate quantities, will produce black: because they will together absorb, or obstruct the passage of all coloured light, or, in other words, cause its total privation, whence blackness must result. If we suppose a piece of cloth, to which these three colours have been communicated, but not in such proportions as to produce a pure black, we shall have a tint corresponding to the colour that is in excess; as, for example, a blue, violet, red, or greenish *black;* and with paler tints we shall have a bluish, violet, red, or greenish *gray*.

Gall-nuts, and a salt of iron, so generally employed for the black dye, give merely a violet or greenish gray, and never a pure black. The pyrolignite of iron, which contains a brown empyreumatic matter, occasions a brown inclining to greenish yellow in light shades, and to chesnut brown in dark hues. By galling cotton and silk, after a bath of pyrolignite of iron, and reiterating the processes several times, a tolerably pure black may be procured. Galls, logwood, and a salt of iron (copperas) produce merely a very deep violet blue; but if they be applied to wool in a hot bath, with frequent exposure to air, the logwood induces a brownness which is favourable to the formation of black.

The black dye for hats is communicated by logwood, copperas, and verdigris mixed in certain proportions in the same bath; from that mixture there results a vast quantity of an ochreous muddy precipitate, amounting to twenty-five per cent. of the copperas employed. This mud forms a deposit upon the hats which not only corrodes the fine beaver filaments, but causes both them and the felt to turn speedily of a rusty brown. A well-dyed black hat should retain its original tint as long as it lasts. There is no process in dyeing so defective as that of hats, or which stands so much in need of scientific amelioration. The hatter tries to wash away this ochreous mud by dilute sulphuric acid, and then counteracts the acid by a weak alkaline bath, thus introducing two adventitious evils as remedies for the first and main evil, which a very little chemical science could obviate.

Since gall-nuts give a blue precipitate with the peroxide salts of iron, they are occasionally replaced by sumach, bablah, &c.; but account should be taken in this substitution of the proportions of red or yellow colouring matter in these substances, relatively to the tannin which alone forms the blue precipitate. When a black of the best possible shade is to be given, the wool should be first grounded with indigo, then passed through a bath of logwood, sumach, and protosulphate of iron (green copperas). Sumach and nut-galls may also be employed in the proportion of 6 to 2½; or the sumach may be replaced by nut-galls, if they be equal to one-third of the sumach prescribed. A good black may be dyed upon an indigo ground with 100 pounds of wool, by taking 200 pounds of logwood, 60 pounds of sumach, 2½ pounds of galls, and 20 pounds of green copperas; and giving three heats of two hours each to the wool, with airings between. A good black, without an indigo blue ground, may be given to 100 pounds of wool, by boiling it in a bath of 25 pounds of alum and 674 of tartar; grounding it with weld and madder; then passing it through a bath of 200 pounds of logwood, 60 of sumach, and 2½ of galls; taking it out, adding to the bath 20 pounds of copperas; lastly, giving it three heats of two hours each time.

The best French black, according to Hellot, may be given to wool by first dyeing it a dark blue in the indigo vat, washing and fulling it; then for every 50 pounds, putting into the copper 8 pounds of bruised galls, and as much logwood tied up in a coarse canvas bag, and boiling them for twelve hours. One-third of the bath thus prepared is to be transferred into another copper with one pound of verdigris, and the wool or stuff is to be worked in this solution without intermission for two hours, the bath being kept hot, but not boiling. After taking out the stuff, another third part of the first bath is to be added along with four pounds of green copperas; the fire must be lowered while this salt is being dissolved, and the bath being refreshed with a little cold water, the stuff is to be worked through it for half an hour, and then aired. Lastly, the residuary third of the first bath is to be now introduced, taking care to squeeze the contents of the bag. From eight to ten pounds of sumach are added, the liquor is just made to boil, then refreshed with some cold water, after which a pound of green copperas being dissolved in it, the stuff is again passed through it for an hour. It is now taken out, aired, washed, then returned to the copper, and worked in the bath for another hour. It is next washed at the river and fulled. A finish is prescribed in the madder-bath.

The ordinary proportions used by the English black dyers for 100 pounds of cloth, previously treated in the indigo vat, are about 5 pounds of copperas, as much nut-galls bruised, and 30 pounds of logwood. They first gall the cloth, and then pass it through the decoction of logwood in which the copperas has been dissolved. A finish of weld is often given after fulling; but this is of doubtful utility, especially when a little soap has been used in the fulling-mill.

Vitalis prefers the pyrolignite of iron to the sulphate for the black dye, and says it produces a softer and more velvety colour. We by no means join in this opinion, having found the pyrolignite apt to communicate a brown tint to the blue black, an effect producible also by using old copperas peroxidized by exposure to air.

The black dye vat, as it gets exhausted, is employed to dye greys of various shades.

Silk is dyed black in two methods, according to the market for which it is made. When sold by weight, as was formerly the practice at Tours, and is now with silk thread in this country, it is an object with the dyer to load it with as much colouring or other matter as possible. Sugar is at present much employed to falsify the weight of English silk thread, as any person may discover by applying a hank of it to his tongue. We have seen thread more than doubled in weight by this fraudulent device. Such silk is called *English black* by the French, who are not suffered to practise this deception. When silk is sold by superficial measure, on the other hand, it becomes the dyer's object to give it a black colour with as little weight of materials as possible. Hence the distinction well known in the trade of heavy and light silks.

The 25 per cent. of weight which silk has lost in scouring may be in a great measure recovered, by giving it a sufficient dose of galls. For this purpose a bath is made by boiling galls equal to two-thirds or three-fourths the weight of the silk for three or four hours in a sufficient quantity of water, and then letting the decoction settle for two hours. The silk must be steeped in this bath from twenty to thirty-six hours, and then washed in the river. The first galling is however commonly given with a bath somewhat spent; and for heavy blacks generally upon unscoured silk. Several successive immersions in gall-baths, and of considerable duration, are usually given to silk, with intervening washings and wringings at the peg.

The silk dyers keep up from year to year a black vat, often of very complex composition. The essential constituents of the vat are sulphate of iron and gum; but many vegetable matters, as well as filings of iron, are usually added. This bath being heated short of boiling, and then allowed to settle for about an hour, the silks are worked in it with much manipulation, occasional wringing out, airing, and re-dipping. As the copperas and gum get exhausted, the bath must be replenished with these ingredients in due proportions. The addition of logwood and verdigris is very useful to the black silk dye, and is now generally made. A ground of walnut peels is a good and cheap preparation for this dye.

We have entered into these theoretical and practical details concerning the black dye, as we conceive them likely to prove useful to our cloth manufacturers, many of whom have hitherto followed too much a blind routine. Every wearer of a black coat or trowsers is soon convinced to his cost that great improvements remain to be made in this department of dyeing.

II. *Brown or dun colour.*—This dye is not so common in this country as on the continent, where the colouring matter is generally produced at a very cheap rate by steeping ripe walnuts with their peels in water for a year or two till the vat acquires a deep brown colour and a fetid smell. This infusion affords very agreeable and permanent brown tints without any mordant, while it preserves the downy softness of the wool, and requires but a simple and economical process. In dyeing with this infusion, a quantity of it proportional to the shade required is to be put into the copper, diluted with water, and made to boil. The cloth or yarn needs merely to be moistened beforehand with tepid water, to be then plunged in the bath, and turned about till sufficiently dyed. Some dyers, however, give the stuff a preparatory mordant of alum, and leave it to drain for twenty-four hours before subjecting it to the bath of walnut-peels.

Sumach is usually employed in this country to dye fawns, and some browns; but more beautiful browns may be given to woollen stuffs by boiling them first with one-fourth their weight of alum and some tartar and copperas; washing, and afterwards dyeing them in a madder bath. The shade of colour depends upon the proportion which the copperas bears to the alum.

A good brown may also be obtained by mordanting every pound of the stuff with two ounces of alum and one ounce of common salt in a boiling bath; and then dyeing it in a logwood to which some copperas has been added: or the stuff dyed red in the madder bath may be turned about in the black dye vat till the required shade be hit.

The finest browns are produced by boiling each pound of the wool with two ounces of alum, dyeing it in a cochineal bath, and then transferring it into a bath containing a little cochineal darkened with acetate of iron. Instead of cochineal the archil or cudbear bath may be used with a little sumach or galls. This forms a cheaper but a more fugitive colour.

A beautiful brown tint, on wool or silk, may be had by first giving a pale blue shade in the indigo vat, then mordanting with alum, washing and finishing in a madder bath till the proper brown be brought up. The Saxon blue vat may also be used. If the stuff be mordanted with alum and tartar, then boiled in a madder bath, afterwards in one of weld or fustic, to which more or less copperas has been added, we shall have a mordore, cinnamon, or chestnut brown. By the combination of olive shades with red, bronze tints may be produced. For twenty-five pounds of stuff a bath containing four pounds of fustic will suffice. Boil the wood two hours, then turn the stuff in the bath for an hour, take it out, and drain. Add to the bath four or six ounces of copperas and a pound of madder or sandal wood; then work the stuff in it till the wished-for shade is attained.

Silk may receive a ground of annatto, and then be dyed in a bath of logwood or Brazil wood, whereby a fine brown tint is obtained.

Catechu is used for giving a bronze and brown to cotton goods. [CALICO-PRINTING.]

Blue colours are dyed with indigo, Prussian blue, and woad. Yellows with fustic, Persian berries, quercitron, turmeric, and weld. Reds, with archil or cudbear, Brazil wood, cochineal, kermes, lac, logwood, madder, safflower, or carthamus.

The purple, green, and orange dyes may be conveniently considered under the heads of SCARLET DYE, INDIGO, and QUERCITRON.

We shall conclude this article with a few practical remarks. M. Roard, long the skilful director of the Gobelins' dye-works, has observed that copper boilers exercise a considerable influence upon delicate dyes. He found that ammonia causes a blue precipitate in the alum bath made in such boilers, while it causes merely a white precipitate in the same bath made in vessels of glass, porcelain, and tin. When wool is kept for some hours in boiling-water contained in a copper vessel, it acquires a greenish gray tint: a result increased by the ordinary mixture of alum and tartar. If into this bath white wool be plunged, it receives a greenish yellow, or sometimes an ochrey hue.

These observations of M. Roard are of considerable importance, and should lead dyers to employ tin or at least brass boilers instead of copper ones for all vivid colours. Heating with steam, either by double vessels, by straight or spiral tubes, ought on all occasions to be preferred in the dye-house to naked fires, which seldom fail to carbonize some portions of the vegetable or animal matters, and thereby to degrade the colours. The top edge, or surface, of the boilers should be about three feet and a half above the floor; this being a height which the workmen find most convenient for their manipulations when they stand upon a step 8 or 10 inches high.

The stuffs mordanted with alum should not be transferred to the bath immediately, but be allowed to drain in air for 24 hours. The colours are thereby rendered more lively than when dyed soon after the aluming. As experience has proved that an old alum bath is better than one fresh made, it should not be thrown away, but be strengthened or refreshed by the requisite additions of alum and tartar. It is certain that wools boiled in alum the second time, are more beautiful than those boiled in it the first time.

DYER, JOHN, born in 1700, was the second son of a respectable solicitor of Aberglasney in Caermarthenshire. He received his education at Westminster school, and when that was completed, began the study of the law. An early taste for poetry and painting led him to relinquish his legal pursuits, and he travelled about South Wales in the capacity of an itinerant painter. At this period he wrote his poem 'Grongar Hill,' which was published in 1727. Though he seems to have made but small proficiency in painting, he went to Italy to study, where he wrote the 'Ruins of Rome,' a descriptive poem, published in 1740. On his return to

England, having a small independence, he retired into the country, entered into holy orders, and married a lady named Ensor, said to be a descendant of Shakspeare. He died in 1758, shortly after the publication of his longer poem 'The Fleece,' having gradually improved his fortune.

'The Fleece' is a long unreadable poem, of a purely didactic kind. The middle of the last century was remarkably prolific in poems which took for their model Virgil's 'Georgics.' Dyer's 'Fleece,' Grainger's 'Sugar-cane,' and Phillips's 'Cyder,' are all of this class. By selecting subjects essentially unpoetical, whatever might be the ingenuity of the writers, they could do no more than make a tolerable poem of a bad kind; for they did not confine themselves to a mere outline of the subject, which they might fill up with what colouring they pleased, but essayed to give, in a poetical form, the intricacies and minutiæ of various branches of manufacture. The selection of Virgil's 'Georgics' for a model was in itself a fallacy, as we question whether this work, with all its beauties, would be much read at the present time were it not for the opportunity which it affords of studying one of the most elegant writers of the Augustan age, and for the light it throws on the agriculture of the antients. The 'Ruins of Rome,' with here and there a fine line, seldom rises above mediocrity, and is a very heavy performance.

It is on the poem of his youth, 'Grongar Hill,' that Dyer's reputation depends. There is, perhaps, no depth of thought, no new idea in this work, but it is a most vivid and brilliant combination of pleasing images. The poet invokes the muse to 'draw the landskip bright and strong,' and the muse seems to grant his request. We may conceive the poem to be the work of a man walking up-hill, and struck with the succession of scenery which opens all around, he says the first thing that comes into his head; and as he is affected by none but beautiful prospects, what he says is sure to be pleasing. 'Grongar Hill' will always be a general favourite.

DYKE (in Geology), a fissure caused by the dislocation of strata, commonly also termed a fault. Dykes are of frequent occurrence, and often extend several miles, penetrating generally to an unknown depth. They must have been produced by some violent disturbances, and the amount of dislocation of necessity would vary in proportion to the intensity of the disturbing force. Accordingly there are many dykes of great width and extent, which materially affect the face of the country in which they occur, while there are others so slight that it requires much care and observation to ascertain their existence. The strata are in most cases uplifted on one side of the dyke much higher (varying many fathoms) than those on the other side, and produce an apparent irregularity of strata most perplexing to the geologist. Sometimes it happens that, without any irregularity of surface, two distinct strata appear to form a continuous line, as in the Black Down Hills in Devonshire. [Cretaceous Group.] In some cases, however, dislocation is found without any alteration of the *level* of the strata on either side, but the appearance of the strata immediately adjacent to the fault sometimes affords proof of the action of fire. [Coal Fields.] Dykes are of two distinct characters, depending upon the manner in which they have been filled up, and the substance of which they are composed. Dykes of the first description are those into which igneous rocks are supposed to have been injected in a state of fusion, and now appear as a consolidated mass. [Basalt.] In the second the fissures are filled with the debris, sometimes mixed with clay, of the dislocated strata through which they pass. In some cases the fissure has evidently remained unoccupied for a long period, and the filling up has proceeded gradually from the sides inwards. This is observed very evidently in the carboniferous limestones of England and Wales. Sometimes, in consequence of the great length of time intervening between the production of each coating of calcareous matter, the outside of each is covered with crystals, upon which the next layer has been formed: in the central portions of such fissures cavities are by no means uncommon.

DYLE. [Schelde.]

DYNA'MICS (*δύναμις*, force), a word of comparatively modern use, now universally adopted as signifying the science of matter in motion, as distinguished from *statics*, which relates to matter at rest. Under so general a term, our plan requires us simply to refer the reader to the several articles connected with the subject.

Dynamics may be divided into two distinct parts: the mathematical consideration of motion, without reference to any connexion with its cause; and the experimental investigation of the connexion between pressure and the motion produced by it, together with the mathematical exhibition of the laws under which the second is a consequence of the first. The former branch is purely mathematical, and will be further treated under the head Motion, Relative; the latter will be found, as to its experimental part, under Motion, Laws of; and as to the mathematical part, under Forces, Impressed and Effective, and Virtual Velocities, Principle of. We need not suggest that such articles as Force, Gravitation, Attraction, Percussion, Friction, &c. &c. contain the details of matters connected with the general term dynamics. The history of dynamics is particularly connected with the names of Galileo, Huyghens, Newton, D'Alembert, and Lagrange. See also on this point Mechanics, the general term under which statics and dynamics are included.

DYNAM'OMETER (measurer of power), a term which has been applied to an instrument which measures any thing to which the name of power has been given, whether that of an animal, or (to take a very different instance) of a telescope. We have also seen the incorrect term *dynometer*.

DYNO'MENE, a genus of brachyurous crustaceans belonging to the division *Notopoda*, founded by Latreille.

Character.—Ocular pedicles longer than those of *Dromia*. *Shell* wide, nearly heart-shaped and truncated posteriorly, hairy or bearded. *Two posterior feet only* dorsal, and much smaller than the others.

Example, *Dynomene hispida*, the only species known to M. Latreille. Locality, Isle of France.

Dynomene hispida.

DYRRA'CHIUM. [Durazzo.]

DY'SENTERY (*Δυσεντερία*, *Dysenteria*, from *δύς*, *with difficulty*, and *ἔντερον*, *intestine*; *difficultas intestinorum*, *bloody flux*), a disease in which there is difficulty and pain in passing the stools, which consist of mucus and blood, containing little or no fæculent matter, and generally attended with fever. The desire to evacuate the bowels is frequent and urgent; but the effort is accompanied with severe pain, and is often altogether ineffectual, constituting the affection called tenesmus. What scanty stools are passed consist, as has been stated, of mucus mixed with blood, or of pure blood in considerable quantity; and if any fæculent matter be present, it is commonly in the form of round and hard balls called scybalæ. There is always griping pain in the abdomen. More or less fever is invariably present. The seat of the disease is chiefly in the large intestines: the disease itself consists essentially of inflammation of the mucous membrane.

The forms of this disease, the causes which produce it, the circumstances under which it prevails, the pathological conditions on which its essential characters depend, and its degrees of intensity, are infinitely various; and these modifying influences cause it to assume at different seasons, in different climates, and in different constitutions, the most diversified aspects. It is sometimes a primary, sometimes a consecutive, and sometimes a symptomatic disease. It is now sporadic, now endemic, and occasionally both endemic and epidemic. It is sometimes inflammatory and sthenic, at other times typhoid and asthenic, at one time acute, and at another chronic. These differences are attended with essential differences in the nature of the disease, which not only communicate to it different external aspects, dependent on different internal conditions, but which require totally different remedies.

In the acute form of dysentery, when purely inflammatory, and when mild in character, constipation commonly precedes for some days the attack of diarrhœa. The liquid and frequent stools which at length succeed to this state of constipation soon become streaked with blood; the griping pains which accompany the evacuations, and the straining and tenesmus which follow them, are often attended with distinct chills. The stools may be from eight or ten to sixteen or twenty in the twenty-four hours. The pulse is commonly quick and small, the tongue loaded, and the appetite little impaired.

When the attack is more severe, it is generally attended at the very commencement with diarrhœa, often accompanied with nausea and vomiting, quickly succeeded by scanty, mucous, or gelatinous stools, streaked with blood, preceded by tormina, and followed by tenesmus. The pain in the course of the large intestines may be either severe, or it may not be urgent, but rather a sense of heat and aching than acute pain. Pain, however, is always induced by full pressure over the tract of the colon; and if, in any particular part of this tract, there be urgent pain, some degree of fulness may generally be perceived there. The progress of the disease is indicated by the increasing severity of all the symptoms, and more especially by the increasing frequency of the stools, by the increasing tormina and tenesmus, and the augmentation of the general febrile symptoms. It is not uncommon for from twenty to forty efforts at stool to be made in the twenty-four hours, with the effect of passing only a very small quantity of mucus and blood. In all cases the evacuations are exceedingly offensive; in the worst they are of a cadaverous odour, and the clots of blood are sometimes mixed with pieces of coagulated lymph or fibrin.

In hot climates the disease is still more intense. The heat, the tormina, and the tenesmus, are more urgent and distressing; the thirst becomes excessive, the urine scanty or altogether suppressed, the stools slimy, streaked with blood, and attended with *prolapsus ani*, or watery and ichorous, 'resembling the washings of raw beef, in which float particles or even large shreds of coagulable lymph, thrown off from the acutely-inflamed surface.' In these cases the prostration of strength is extreme, and is increased by most distressing and exhausting vomiting. When, as sometimes happens in this form of the disease, portions of the mucous coat of the intestine slough away, the countenance of the patient is sunk and cadaverous, and the odour of the stools, and in some degree, indeed, of the whole body, is putrid.

In the asthenic form of dysentery, the tormina, tenesmus, and mucous and bloody stools are attended with great depression of all the organic functions, and extreme prostration of strength. The local dysenteric symptoms, exceedingly urgent from the commencement, are rapidly followed by fever of a low nervous or typhoid type. This form of the disease often prevails as an epidemic; and under circumstances favourable to their accumulation and concentration, exhalations from the stools of the sick seem capable of producing dysentery in persons directly exposed to them, previously in a state of sound health. These forms of the disease are very apt to occur in hot seasons and in hot climates, where great numbers of persons are collected together in close and ill-ventilated apartments, in damp and unhealthy situations, as in barracks, garrisons, camps, crowded ships, &c. It is this form of dysentery which rages among the poor in seasons of scarcity, which sometimes destroys whole armies in countries laid waste by war, and which so constantly, in besieged towns, anticipates the havoc of the sword.

The duration of dysentery is as various as its types. It may prove fatal in a few days or hours, or last for weeks and even months, and ultimately destroy life by inflammation and gangrene of the bowels. In some cases the disease ceases spontaneously, the frequency of the stools, the griping and the tenesmus gradually diminishing, while natural stools return; but in other cases the disease with moderate symptoms continues long, and ends in protracted and exhausting diarrhœa.

The causes which predispose to dysentery appear to be long-continued exposure to a high temperature, or alternations of heat and cold; hence the disease is generally most prevalent in summer or autumn, after considerable heats have prevailed for some time, and especially after very warm and at the same time very dry states of the weather. It is certainly more frequent, as well as much more severe, in hot than in cold or even in temperate climates. All ob-

ed experience show that a powerful predisposi-

disease is formed by the habitual use of a high

ting diet, and especially by indulgence in spirituous liquors, by excessive fatigue; and by all c which enfeeble the constitution in general, at the same that they over excite the alimentary canal in particul

The exciting causes are long-continued exposure tense heat, or to sudden and great alternations from to cold; exhalations from vegetable and animal matt a state of decomposition, as from marsh, stagnant, sea water, from animalculæ and minute insects, or the flesh of deceased animals; noxious exhalations the bodies of persons crowded together in close and fined situations, and more especially, as would appear the discharges from the bowels of persons labouring dysentery; scanty and bad food, consisting more esp of vegetable or animal matter in a state of decay, as meat, stale fish, unwholesome bread, unripe rice, rye, &

The inflammatory affection of the mucous membr the large intestine in which dysentery essentially passes, in the severe forms of the disease, into ulc and even gangrene. On the examination of the larg testine in fatal cases after death, there is often found sion of coagulable lymph, ulcers of various forms, patches more or less extensive of mortification. In the malignant varieties the internal surface of the wh mentary canal is of a livid, purple, or dark colour, patches of excoriation, ulceration, and gangrene.

In the acute form of dysentery, when the fever is the pain intense, and the inflammation active, blood-l from the arm is indispensable, which must be repea the subdual of the acute inflammatory symptoms. After moderate general blood-letting, however, the local abst tion of blood by leeching or cupping is more effica the number and the repetition of the leeches must of depend on the urgency of the pain and the *strength of t* patient. The employment of purgative remedies in dys tery requires the greatest discrimination and caution. I the colon be distended with feculent matter which it c not discharge, no remedies will succeed until this acc lation is removed; if, on the contrary, there have already frequent and copious discharges of feculent ma the administration of purgatives is absurd, for all pur are irritants, and the diseased membrane is already state of intense excitement. The practitioner should fore carefully examine the state of the bowels with to their fullness or emptiness of fæcal matter, and actual state in this respect can almost always be as with a great degree of certainty if due pains be t discover it. If there be reason to suppose that there accumulation of fæces, the mildest purgatives sh given, of which the best is castor oil, and this sh cautiously repeated until the irritating matter is moved. Great relief is at the same time afforded distressing tormina and tenesmus by emollient and enemas injected in very small quantities. After the dual of the inflammatory state by blood-letting, and evacution of the accumulated fæces by mild purgatives great object is to soothe the irritated membrane by on the judicious employment of which, and the skilful bination and alternation of this class of remedies w purgatives, the successful treatment of ordinary d mainly depends. The acute forms of dysentery in h mates require a prompt and decided combination of dies, the best selection and administration of wh impossible to discuss here. The asthenic forms phoid symptoms need a guarded yet active tr nearly the same as that which is proper to typh with abdominal affection. [FEVER.]

DYSPE'PSIA (Δυσπεψία, *dyspépsia*). *Indig* difficult and imperfect conversion of the food in triment. Digestion is a part of the great fu nutrition; its ultimate object is to convert t ment into blood. Between the articles taken and the nutrient fluid of the body—the blood, t no obvious analogy, and there is a wide diff nature. Hence the function of digestion consists of cession of stages, at each of which the food unde specific change. Each change is effected by a process, for the accomplishment of which a special tus is provided. Of these processes the chief are mast deglutition, chymification, chylification, and fæcation. delicacy and complexity of the apparatus by which these processes is carried on has been already [DIGESTION.] The healthy condition and the natural of every individual organ belonging to the portion of systems proper to each of these processes is necessary to the sound state of the function of digestion. It is easy therefore to see by how many causes it may be disturbed; in how many different organs the source of the disturbance may have its seat, of how varied a nature the disturbance may be, and how greatly the disturbance of the digestive function may derange the other functions of the body.

In the history of the human family there is no known community of human beings in any country, and no age of human life, in which the first necessity of existence, that of taking food for the nourishment of the body, is not the cause of disease and death to great numbers, and of uneasiness, nay, sometimes even of intense pain to far greater numbers. Why is this? Why is the digestive process more productive of suffering, disease, and death in man than in the lower animals of a similar structure, in which the function, considered in a physiological point of view, is scarcely at all less complex? The correct answer to this question would include a clear account of the causes of dyspepsia, and would suggest the appropriate remedies for the disease.

Digestion, being an organic function, when this function is healthfully performed, for reasons which have been fully developed, it is unattended with consciousness. The first effect of the disturbance of this function is to render the patient not only conscious, but painfully conscious, that he has a stomach. A sense of nausea, sometimes, when the dyspepsia is severe, even vomiting, an uneasy feeling of fulness, distension, weight in the region of the stomach, occasionally amounting to pain, and even severe pain, flatulence, eructations, a sensation of sinking, and lastly, a loss of appetite, constitute the train of uneasy sensations which, coming on after the reception of food, indicate disordered digestion, and which take the place of the feelings of refreshment and exhilaration which result from healthy digestion.

When these uneasy sensations are occasioned by a disordered state of the stomach, it is easy to understand, from the exposition already given of the structure and function of this organ [DIGESTION], that the disorder may consist in a derangement either of its secreting arteries, or its mucous glands, or its organic nerves, or its muscular fibres, inducing a deficient secretion of the gastric juice, a deficient secretion of mucus, a diminished or increased irritability of the muscular fibres, by which the contents of the stomach are disturbed. If the gastric juice be deficient, the first step in the digestive process cannot take place, the food cannot be dissolved; if the mucus be excessive, the contact of the gastric juice with the food may be prevented; if the muscular fibres of the stomach are torpid or too irritable, the food may be detained too long or too short a time in the stomach.

The causes of dyspepsia are either those which act directly and immediately upon the stomach itself, or those which act upon the whole body or upon particular parts of it, but which still affect the stomach principally and almost solely. Of the first kind are noxious, irritating, and indigestible substances taken into the stomach as articles of food or drink, such as tainted meat, decayed vegetables, unripe fruit, very acid matters, ardent spirits, &c.; and even wholesome food taken too frequently or in too large a quantity, especially when its nature is very nutritious, as when it consists principally of animal matter, or when a large quantity of nutriment is presented to the stomach in a very concentrated form, or is rendered too stimulating by being highly seasoned; the abuse of fermented and spirituous liquors, which are one of the most frequent causes of dyspepsia in its worst and most fatal forms; and large quantities of fluids, especially taken at too high a temperature, as very hot tea, coffee, or soup.

Of the second kind, or the causes which act upon the whole body or upon particular parts and functions of it, are want of pure air; hence the frequency of dyspepsia in large and crowded cities, and more especially in narrow and confined lanes and alleys, in the dirty and ill ventilated dwellings of the poor. Want of exercise: from physical inactivity all the organs of the body languish, but the stomach first and most. Intense study or close application to business too long continued, implying both want of air and want of exercise. Mental emotion, more especially the depressing passions, fear, grief, vexation, disappointment, anxiety and hope deferred. Exposure to the influence of cold and moisture. In persons with weak stomachs and delicate skins, a cold damp day, more especially suddenly succeeding a hot day, often produces a severe attack of dyspepsia. Hence it is that dyspeptic complaints are so prevalent when cold and damp weather first sets in. Cold is a sedative to the nervous system, as heat is an excitant; and the depressing effects of cold seem to be peculiarly manifested on the nerves of the stomach. Excessive discharges from the body, as flooding, leucorrhoea, large bleedings from the arm, profuse and long-continued sweatings, and above all protracted suckling. It is a common practice among the poor in this country to suckle their children too long. A feeble woman is often seen with a strong child at her breast a year and a half or two years old. The effect upon the constitution of the mother is most pernicious. Emaciation, sharpness of the features, with a peculiar expression in the countenance of languor and exhaustion, a sense of sinking at the pit of the stomach, dimness of sight, giddiness, spectra of different kinds dancing before the eyes, headache, with a small, quick, and sometimes almost imperceptible pulse, and total loss of appetite, are the peculiar characters of this variety of dyspepsia.

The state of dyspepsia is most frequently a state merely of disordered function, without any appreciable change of structure in any of the tissues of the stomach. But all the symptoms of dyspepsia are produced in their intensest degree when they arise from some organic disease of the stomach. Of these the most frequent is inflammation of its mucous coat. This inflammation may be either acute or subacute. When acute, the nature of the malady is indicated by characters so striking that it cannot be overlooked; but the subacute form often exists for a long period quite unsuspected, producing violent and obstinate dyspepsia, which is often greatly aggravated by the remedies employed to remove the complaint. The diagnostic sign of this form of the disease is tenderness on pressure in the epigastric region. In scirrhus of the pylorus and ulceration of the mucous glands of the stomach, organic disease not of unfrequent occurrence, there is superadded to the ordinary signs of dyspepsia a peculiar train of symptoms scarcely to be overlooked or mistaken.

But dyspepsia is often the result of disease situated not in the stomach, but in some other organ. The stomach has been justly called the centre of sympathies, and there is scarcely any disorder of the body which does not affect the functions of the stomach in a greater or less degree. The organs the diseases of which are most apt to produce disorder of the stomach are the liver, the spleen, the uterus, the kidney, the bronchi, and the skin. In this secondary form of dyspepsia, the disease cannot be removed unless the seat of the primary affection, and the true nature of that affection, be ascertained.

The stomach is the organ in which chymification is effected. Chylification is accomplished in the duodenum, and completed in the jejunum, ilium, and mesenteric glands; and the highly important part of the digestive process, that which consists in eliminating and carrying out of the system the non-nutrient portion of the aliment, is performed by the large intestines. Each of these organs may be the primary seat of disease, giving rise to the ordinary symptoms of dyspepsia; but to these there will generally be superadded peculiar signs pointing out the real seat of the malady, signs almost always to be observed if carefully looked for, and the detection of which is of the utmost importance in the treatment of the disease.

The indications of cure are to avoid or remove the remote causes, to remove the symptoms which especially contribute to aggravate and continue the disease, and to restore the healthy tone of the disordered organs. There is no drug, no class of medicines, no one mode of treatment capable of removing dyspepsia when present, or of preventing its recurrence. This can only be done by a careful study of the exact cause of the disease in every individual case, and the precise seat and nature of the affection. The mode of treatment must be modified in strict accordance with these circumstances; and no mode of treatment will be attended with success of which the appropriate regulation of the diet and exercise does not form an essential part.

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E.

E occupies the fifth place in the Hebrew alphabet and those derived from it. The vowels, when arranged according to their physical affinity, would lie in the series *i, e, a, o, u* [ALPHABET]; and accordingly the vowel *e* is frequently interchanged with its neighbours *i* and *a*. It is occasionally convertible with *o* and *u*.

1. *E* is interchanged with *i*. Thus in Latin the old datives *heri, mani, ruri, omni*, afterwards took the forms *here, mane, rure, omne*; and the words *magis, potis, tristis*, when they appeared without an *s*, were written *mage, pote, triste*. The same interchange appears in the declension of the adjective *is, ea, id*, and the conjugation of the verbs *eo* and *queo*.

2. *E* in Latin often corresponds to *oi* in French. Thus many Latin infinitives in *ere* reappear in French with the termination *oir*, as *habere, debere*; *avoir, devoir*. The Latin past imperfect has the suffix *ebat*, which passed through the forms *eve* and *ei* to *oie* and *oi*. Thus from *habebam* were deduced *aveve, aveie, avoie*, and lastly *avois*. This final *s* does not appear in the oldest forms of the French language. Other instances of the change of *e* into *oi* may be seen in the Latin adjectives and other words in *ensis* or *esis*, which in French have the suffix *ois*, as *Viennensis, Viennois*; *mensis, mois*.

3. *E* Latin into *ie* French, as *mel, bene, ped*; *miel, bien, pied*.

4. *E* into *a*. This is well marked in the dialects of the Greek, ἡμερη, Ionic; ἁμερα, Doric, &c. Hence the Latins have often an *a* where the common dialect of the Greek had *e*, as μηχανη, πληγη; Lat. *machina, plaga*. Both forms often coexist in Latin, as *tristitia* and *tristities*. The *a* is often changed into *e* in Latin, if a prefix is added, particularly if two consonants follow the vowel, as *factus, confectus*; *pars, expers*; *saltus, insultus*; *ars, iners*.

5. *E* into *o*. Especially in Greek, as λεγω, λογος; τρεπω, τροπος. The Latin language prefers the *o*, as [illegible]. This change is particularly common in words beginning with a *v*, or with what was pronounced as a *w*, the Latin *v*. Thus *vester, velim, verto, vult*, were once written *voster, volim, vorto, volt*. Even in our own language *worm* (*vermis*, Lat.), and *work* (ἐργον, Gr.), are now pronounced as if written with an *e*. The Greek even interchanges a long *e* with a long *o*, as [illegible].

6. ε Greek is changed into *u* in Latin before an *l*, as Σικελος, Siculus.

E (in music), the third note or degree of the diatonic scale, answering to the *mi* of the Italians and French.

EADMER, or EDMER, the friend and historian of Archbishop Anselm, lived in the twelfth century, but we have no information respecting his parents, or the particular time and place of his nativity. He received a learned education, was a monk of Canterbury, and became the bosom friend and inseparable companion of two archbishops of that see, St. Anselm and his successor Ralph. To the former of these he was appointed spiritual director by the pope. In 1120, by the desire of Alexander I. of Scotland, he was elected bishop of St. Andrews; but on the day of his election a dispute arose between the king and him respecting his consecration. Eadmer wished to be consecrated by the archbishop of Canterbury, who, he contended, was the primate of all Britain; while Alexander contended that the see of Canterbury had no pre-eminence over that of St. Andrews. Eadmer finally abandoned his bishopric and returned to England, where he was kindly received by the archbishop and clergy of Canterbury, who yet thought him too precipitate in leaving his bishopric. Eadmer at last wrote a long and submissive letter to the king of Scotland, but without producing the desired effect. Wharton fixes his death in 1124, the very year in which the bishopric of St. Andrews was filled up. Eadmer is now best known for his history of the affairs of England in his own time, from 1066 to 1122, in which he has inserted many original papers and preserved many facts which are no where else to be found. His style is regular and good, and his work more free from legendary tale than is usual with the works of his time. The best edition is that by Selden, intitled 'Eadmeri Monachi Cantuariensis Historiae Novorum, sive sui Saeculi, Libri sex,' fol. London, 1623. His life of St. Anselm was first printed in 12mo. at Antwerp, in 1551, under the title of '*Fratris Edmeri* Angli de Vita D. Anselmi Archiepiscopi Cantuariensis Libri duo.' Several others of his works, with the 'Historia Novorum,' were edited by the congregation of St. Maur at the end of Father Gerberon's editions of the works of St. Anselm, fol. Par. 1675 and 1721. His Lives of St. Wilfrid, St. Oswald, St. Dunstan, &c., with that of St. Anselm, were inserted by Wharton in his Anglia Sacra. (Tanner, *Bibl. Brit. Hib.*; *Praef. ad Opera S. Anselmi* ut supr.; Chalmers's *Biogr. Dict.*)

EAGLE. [FALCONIDAE.]

EAGLE (constellation). [AQUILA.]

EAGLE (coin). [MONEY.]

EAGLE, Roman Standard. The eagle, as a symbol of empire, is often seen on ancient coins and medals, and on none more frequently than on those of the Ptolemies of Egypt and the Seleucidae of Syria. As an ensign or standard, borne upon a spear, it was used by the Persians in the time of the younger Cyrus. (Xenoph. *Anab.* i. 10.)

Pliny (*Hist. Nat.* lib. x. c. 4. edit. Harduin, tom. i. p. 540) says that, till the time of C. Marius, the Romans used five different animals for standards—the wolf, the minotaur, the horse, the boar, and the eagle—but that in Marius's second consulate they adopted the eagle as the sole ensign for their legions.

The eagle used by the Romans as a standard was of gold or silver: the latter metal, we are told by Pliny, was most frequently used, as the more glittering, and of course more readily seen. It was borne, like the Persian eagle, on the summit of a spear, and was of the size of a pigeon, with its wings displayed. It sometimes rested upon a cross bar on the top of the spear, and sometimes upon shields piled up. On the reverses of some of the coins of Augustus and Galba, in second brass, the legionary eagle is represented holding the thunderbolt in its talons. The small size of the eagle often contributed to its concealment, when the legion to which it belonged was defeated. The name of the legion was usually engraved upon it. Tacitus, in his *Annals* l. i. 60, relates the finding of the eagle of the nineteenth legion by Germanicus, which had been lost in the massacre of Varus.

Cicero (*Catilin.* i. c. 24) says that Catiline had a silver eagle in his house as his tutelar divinity, which was also his standard in war.

A Roman eagle in steel, found at Silchester, presumed to have been a legionary eagle, was exhibited to the Society of Antiquaries in 1788 by the then bishop of Carlisle.

The reader will see a great deal of learning displayed upon this and the standard of the cohorts in M. Le Beau's 'Quatorzième Mémoire sur la Légion Romaine; Des Enseignes.' Mém. de l'Académie des Inscript. tom. xxxv. 4to. Par. 1770, pp. 277-305.

EAGLE-WOOD, one of those substances of which the name, from similarity of sound in a foreign language, has been converted into another having no reference to its original signification. It is a highly fragrant wood, much esteemed by Asiatics for burning as incense, and known in Europe by its present designation ever since the Portuguese visited and imported the substance direct from the Malayan islands and the kingdom of Siam, where it has always been abundant, and long established as an article of commerce. The Malayan name is *agila*, whence the wood was called pao-d'agila by the Portuguese, and has since been converted into pao-d'aguila, and pao-d'aquila, bois-d'aigle, eagle-wood, and agel-hout.

From the Malayan *agila* has probably been derived the Sanscrit *agaru*, whence we have the Hindu *aggur*, if not from the more familiar appellation of *garoo*, by which eagle-wood is also known in the Malayan Archipelago. In Persian works on Materia Medica in use in India, we learn from Dr. Royle (*Illustr. of Himal. Bot.*, &c.) that several kinds of fragrant wood are described under the Arabic name *ood* (*haud* and *od* of Garcias), and that he himself obtained three kinds in the bazaars of India, called *ood-i-hindee*, *ood-i-chinee*, and *ood-i-kimaree* (evidently the al-comericum of Arabian authors), and that with the above Hindu a Greek synonyme, *agallochee*, is also given, and more especially applied to aod-i-kimaree, which is also called *aod-i-bukhoor*, incense-wood. As agallochee is no doubt a corruption of the *agallochum* of Dioscorides, described by him as a fragrant wood from India and Arabia, it is interesting to find that the translators from the Greek into the Arabic of the school of Bagdad settled these synonyms at a time when they must have been well acquainted, from their profession and position, with the substances to which both the Greek and Arabic names were applied. Serapion and Avicenna describe several kinds of this fragrant wood, and the latter under both agalugen or aghaloojee, and *aod*, which in the Latin version is translated *Xyloaloe*, a name that was applied by the later Greek medical writers to agallochum, whence we have lignum aloes, lign-aloe, and aloes-wood, the origin of which it is difficult, if not impossible, to ascertain, unless we suppose it to be a corruption of *agila;* for the bitter, scentless, spongy-textured stems of the genus aloe could not afford any substitute for this fragrant wood, or be thought to yield it, at least by the Arabs, who were well acquainted with, and accurately describe aloes, and the place, Socotra, where the best kind is found. Though Dioscorides notices only one, which some supposed to be the Tarum of Pliny, several kinds of agallochum are described by Serapion and Avicenna, which, as it is not possible at present to identify, it is unnecessary to notice, and therefore we shall refer only to the three kinds which have been traced to the trees yielding them, by naturalists who have visited the countries where these are indigenous.

An *Aguila brava* (wild) is mentioned by Garcias as produced near Cape Comorin, in the southern part of the Indian peninsula, and in the island of Ceylon; but the tree yielding this wood has not been ascertained. Rumphius (*Herb. Amb.* ii. p. 40), describes two kinds of *agallochum spurium*, found in Borneo and Sumatra, one of which he calls *Garo Tsjampaca*, which is described as having leaves and flowers resembling those of the celebrated champa, *Michelia champaca*, and may be a species of the same genus. A third kind of spurious agallochum, differing much from the others as well as from the genuine, he describes in another part of his work, ii. p. 240, as the produce of his *Arbor excæcans*, so called from the acridity of its juice blinding people, and which is the *Excæcaria agallocha* of Linnæus. Considering that Rumphius, in originally describing this tree, has said 'Lignum hoc tantam cum agallocha similitudinem,' and as affording a substitute for that substance, it is not surprising that it should be frequently quoted as the tree which yields the genuine agallochum, or aloes-wood. Fée (*Hist. Nat. Pharm.*) states that he had seen a genuine specimen of the wood of this tree, and that its fragrance cannot be compared with the agallochum of Loureiro. Dr. Roxburgh mentions that the wood-cutters of the Delta of the Ganges, though well acquainted with the highly acrid and very dangerous milky juice of this tree (there called geria), do not mention agallochum of any kind being found in this tree.

Of the two kinds of agallochum which are most valued, and both considered genuine, one is distinguished by the name of Calambac, and the other as the Garo of Malacca.

The first, called calambac, and *agallochum primarium* by Rumphius, appears, as far as hitherto known, to be a native of Cochin China only, growing on the mountains of that country in about 13° of N. lat., near the great river Lavum, which may be the Meikeng flowing between Cochin China and the Laos. This tree was named *Aloexylum agallochum* by Loureiro, *Fl. Cochin Chinensis*, p. 327, and placed by him in Decandria Monogynia, and described as a lofty tree with erect stem and branches, long lanceolate shining leaves, terminal bunches of flowers, with a woody, falcate, one-seeded pod for its fruit, whence it is referred by De Candolle to the natural family of Leguminosæ. Loureiro states that the wood of this tree is white and inodorous, and that its fragrance is the result of disease, when the oily portions thicken into resin in the central parts of the tree, and that no part of the tree is milky or poisonous, but that paper is made from its bark in Cochin China, as in Japan from that of the mulberry.

The next kind of agallochum is that commonly called *garos*, and to which the name of eagle-wood is more frequently applied, and which has long been an article of export from Malacca and the kingdom of Siam. Specimens of the tree which yield this were first obtained by M. Sonnerat in his second voyage to India, from which probably have been given the figure and description by Lamarck. (*Enc. Méth.*, i., p. 49, Illustr. t. 376.) The plant he named *Aquilaria Maluccensis*. This, the *Garo de Malacca*, was introduced by Dr. Roxburgh into the Botanic Garden of Calcutta, and was not to be distinguished from specimens of a tree called *ugoon*, which is a native of the mountainous tracts east and south-east from Silhet, between 24° and 25° of N. lat., which flowers in April, and ripens its seed in August, and which he says there can be little or no doubt furnishes the real Calambac or Agallochum of the ancients, adding, that there seems more reason to think that it was carried to China from our eastern frontier, than to suppose it was carried from Cochin China, or any other country in the vicinity of China, where it has always been in great demand. Small quantities are sometimes imported into Calcutta by sea, from the eastward; but such is always deemed inferior to that of Silhet. (*Fl. Ind.* ii. p. 423.) As the Malacca plant had not flowered, Dr. Roxburgh was unable to decide that they were positively the same with those from Silhet, and therefore named these *Aquilaria agallocha*, as another species of the same genus. By this name it has been figured in Royle's *Illustr.* i. 36, f. 1, from a drawing by Dr. Hamilton of a plant which he called Agallochum officinarum, and which he found near Goalpara, on the eastern frontier of Bengal. This drawing is illustrated with dissections by Dr. Lindley. To the above-quoted work, and the latter's 'Natural System of Botany,' we refer for the botanical details and the characters of the family of *Aquilariaceæ*, to which this genus gives its name. The fragrant nature of genuine agila or eagle-wood is well known, and that it has from very early periods been employed both by the natives of India and of China as incense. Mr. Finlayson, in his visit to Siam, says, that the consumption of this Lign-aloe odoriferous wood is very considerable in Siam, but that the greatest part is exported to China. In the latter, it is used in a very economical manner; the wood being reduced to a fine powder and mixed with a gummy substance is laid over a small slip of wood, about the size of bull-rush, so as to form a pretty thick coating. This is lighted, and gives out a feeble but grateful perfume. French authors inform us that the eagle-wood was burned as a perfume by Napoleon in the imperial palace.

We cannot conclude this subject without inquiring whether the substances of which we have been treating are the lign-aloes of Scripture, *ahaloth*, masc. *ahel*, whose plural is *ahalim*. It would be impossible to do justice to the subject in a small compass, or without referring to the numerous dissertations which have been written on it; but it may be observed, that these might have been much shortened, if the authors had been naturalists, or intimately acquainted with the natural history and usages of eastern countries; such information would at least have prevented any species of aloe being considered or figured as the far-famed and fragrant lign-aloe from a mere similarity in sound. In the present instance, the difficulty is increased by the supposed necessity of reconciling the different passages in which lign-aloes are mentioned, as in *Numbers*, xxiv. 6, where it is mentioned as a tree planted; but in the three other passages, *Proverbs* vii. 17, *Psalms* xiv. 9, and *Canticles*, iv. 14, it is enumerated with the most fragrant products of the East, as cinnamon, cassia, calamus, camphor, frankincense, myrrh, spikenard, and saffron. Here we may observe, that a substance which was indigenous in a country was not likely to have been an article also of commerce from a far country in those early times; and that therefore, as it is disputed whether the word shall be translated *tents* or *lign-aloes*, the word may perhaps be used in a poetical sense, as it is thought to be by some commentators. In the three passages, it may be noticed that, except sandal-wood, there is no other substance which could be so well enumerated with those with which it is found in connexion as the agila wood of the East, whether we consider its high price, delicate perfume, or the long time during which it has been held in high estimation, while the similarity of its name is at the same time remarkable.

EAGRE. [Bore.]

EAR. Many animals unquestionably enjoy the faculty of hearing to a limited extent, which are found, upon examination, to be unprovided with organs exclusively appropriated to the concentration and transmission of sound. In fact, the sense of hearing is, strictly speaking, only a refinement of the sense of touch. The impressions with which it is conversant arise wholly [Acoustics] from peculiar undulations of the particles of ordinary matter, propagated in obedience to its ordinary laws through the medium of which the animal lives, and impinging more or less immediately upon a sensitive part; they have no necessary dependence, like those of sight, upon the agency of the more subtle fluids; nor have they any connexion, like those of smell and taste, with what may be called the *chemical* properties of matter. If to these considerations it be added that the vibratile substances which are commonly found to inclose the sensorium are not ill qualified to participate in the undulations of the surrounding medium, and carry them onwards to the internal seat of perception, the reader will be prepared to learn that the only *essential* part of the organ of hearing is a *nerve*, not materially different from those of common sensation, lodged at a sufficient depth to be secured from external injury, and sufficiently sensitive to be affected by these delicate impulses. This is called the *acoustic* or *auditory* nerve.

It is probable that even the lowest animals provided with a nervous system are able to perceive the notices thus conveyed of external objects, and turn them to account in the degree necessary for their security and comfort. But to meet the increasing wants and minister to the multiplied faculties of the more complete animals, various subsidiary parts are found to be added in something like a regular succession as we advance upwards in the scale, each lower grade possessing the rudiments of some additional provision more fully developed in the next above, till the organ reaches its greatest amplification and final perfection in man and the other mammalia. The particular use of many of these subsidiary parts has not yet been explained. We know in general that they must increase the force and vividness of the impression; that they afford indications of its direction, and the means of appreciating minute shades of difference in its kind and degree, and in the frequency of its repetition; that some of them add to the security of the organ without impairing its delicacy; and that others serve to adjust its position and to adapt it to various changes in the state of the atmosphere. It would be superfluous, in a work addressed to the general reader, and limited in space, to trace these gradual and complicated changes: we must content ourselves with noticing some of the most important of them, and then pass on to the description of the organ as it exists in man: advising the curious inquirer, after he has made himself acquainted with the details of that organ and with the classification of animals by Cuvier, an outline of which is given in a former part of this work [ANATOMY, COMPARATIVE], to consult the admirable essay on this subject by Professor Grant, in the third part of his 'Outlines of Comparative Anatomy,' where he will find a comprehensive and masterly summary of all that is known on the subject, from which we should be inclined to quote largely here, were space allowed and selection easy.

The *Radiata* (star-fish, sponges, &c.), which constitute the lowest, and in point of variety and number by far the most comprehensive division of Cuvier, appear to be universally unprovided with an organ of hearing: many of them have no nervous system, and are therefore probably altogether devoid of the sense.

The *Articulata*, which form the next division, are all furnished with a nervous system, and it is likely that they all enjoy the sense of hearing. Indeed, some of them are able to express their feelings and wants to their fellows by means of peculiar sounds, of which the cricket and queen bee are well-known examples. We find accordingly, that in many of the more perfect species the extremity of the acoustic nerve is expanded upon a simple kind of auditory instrument consisting of a whitish membranous bag of fluid, placed within the head in a somewhat larger cavity, the space between them being also occupied by fluid. This cavity is situated near the outer feelers, or *antennæ*. When the animal lives in water, it is commonly complete; if in air, there is a round external opening closed by a thin, tense and transparent membrane, showing the white colour within, to which the bag adheres, and which receives, concentrates, and transmits the sonorous vibrations of the surrounding medium. This kind of arrangement seems to be necessary, among other reasons, for the purpose of indicating the direction of the sound, which is probably made known in part by the clearer vibration of the membrane when turned in that direction, and in part by a comparison of the impressions on the two sides; for this organ, like all others which bring the animal into relation with the outer world (as distinguished from *vital* organs), is always double and symmetrical. It may be observed that the nerve distributed to the membranous bag just described is given off by that which supplies the antenna with its exquisite sense of touch: some have thought, but perhaps erroneously, that the faculty of hearing resides in the antennæ themselves.

The parts we have enumerated are all found, with others, in the higher animals, and may be considered as the most essential parts of an organ of distinct hearing. The cavity is called the *vestibule;* the soft membranous bag of fluid is the *vestibular sac;* the round external opening is called, from its shape in man and most other animals, the *fenestra ovalis;* the fluids within and without the sac are called respectively the *endo-lymph* and *peri-lymph*, (ἔνδον within, περὶ around); the latter, being analogous to the fluid discovered by Cotugno in the internal ear of mammalia, is sometimes called, after his name, the *liquor Cotunni.*

The principal tribes of the Articulata ascertained to possess organs of this kind are the air-breathing *insects* of the orders *Hymenoptera* (bees), *Orthoptera* (grasshoppers), and *Coleoptera* (beetles); the *Arachnida* (spiders), and the *Decapodous crustacea*, such as the lobster and crab. In the common black beetle they are very conspicuous, appearing externally in the form of round white points on the head, a little nearer the middle line, and somewhat higher than the base of the long outer antennæ. In the lobster they are contained in a small nipple-like prominence or *papilla* upon the under part of the moveable base of the antennæ, looking downwards and forwards. This papilla consists of a substance harder and more brittle and probably more vibratile than the rest of the shell.

The *Mollusca*, though placed higher in the scale of animals by Cuvier, do not afford so many examples of animals possessing a distinct organ of hearing as the Articulata. Such as have been discovered all belong to the order of the *Cephalopods* with two *branchiæ*, or gills, which approach more nearly to the true fishes in their structure than the other mollusks.

In the *Sepia*, or cuttle-fish, which belongs to this order, and which may be taken as a type of the rest, there is a protuberance under the elastic gristly integument at the back part of the head which contains the ear. It consists of a pair of symmetrical vestibules, each containing an oval *sac* filled and surrounded with fluid. On the interior surface of this sac the acoustic nerve is expanded in the form of a white mucous pulp. The sac is supported in the perilymph not only by an adhesion to the inner side of the parietes of the vestibule at the entrance of the nerve, but also by a fine net-work of fibrils which pass from its outer surface to numerous prominent points on the inner surface of the vestibule. There is no fenestra ovalis, or membrane, as in the lobster and the air-breathing insects, but the sac contains a small loose bony or chalky concretion, called an *otolithe* (οὖς-ὠτὸς, the ear, and λίθος, a stone), which answers the same purpose, namely, to indicate the degree and direction of sound; for just as we estimate a weight by poising it in the hand, or, if it be suspended, by gently pushing it from us—thus measuring in our minds the muscular tension necessary to support it, or the force required to overcome its inertia, and conscious of the direction in which we exert our muscles—so, conversely (the weight and inertia of the *lapillus* always remaining the same), the degree and direction of a vibratory force affecting it from without through the medium of the integuments, the parietes of the vestibule, and the fluids within, may be estimated by a consciousness on the part of the animal of the nature of the stress on the sensitive membranes and fibrils which support it, which by their elasticity restrain and redress the slight movements impressed upon it. This should be borne in mind; for, as we shall see further on, it is in some degree by the exertion of the *muscular sense*, as Sir Charles Bell has called that by which we judge of weight and tension, that the human ear is enabled to estimate the intensity of sound. Other curious particulars as to the function of otolithes might be enlarged upon; but we have said enough to explain, as we think, the most important of them; and to correct the misstatements of authors who tell us that they are intended to *increase* the intensity of the vibrations of sound: they appear to us rather calculated to diminish it, as the board floating in the bucket of the water-carrier tends to prevent the fluid from dashing over the side. They undoubtedly play an important part in the organ of hearing, especially in the larger fishes, where they are more numerous, and attain a considerable size;

but it is difficult to conceive that they are possessed of any *intensative* power.

The *vertebrated* classes of the animal kingdom, comprising the true fish, reptiles, birds, and the mammalia, are all provided with acoustic organs, which are very various in their degrees of complexity, but much exceed in that respect the comparatively simple organs of the inferior divisions.

* In the cartilaginous fishes, such as the ray and the shark, the vestibule is deeply imbedded in the elastic walls of the back part of the cranium, near its junction with the spine. The fenestra ovalis, closed by a tense transparent membrane, faces upwards, backwards, and towards the middle line. The membrane is placed obliquely at the bottom of a more superficial, flattened, tubular cavity, which terminates beneath the integument in a kind of forked extremity, and may be considered as a rudiment of the *tympanum*, or middle ear, of the higher vertebrata, with its eustachian tube. The inner surface of the membrane is turned towards three *sacculi*, one of which is much larger than the rest, arranged at the opposite side of the cavity of the vestibule, and containing each an otolithe. The sacs are filled with a thick gelatinous endolymph, which adheres to the lapilli, and serves, with minute filaments such as those in the *sepia*, to steady them. The vestibule is filled with a limpid aqueous perilymph, traversed in all directions by a fine cellular network, by means of which its contents are supported in their relative situations. Besides the fenestra ovalis, other perforations lead out of the vestibule into three arched cylindrical canals of considerable diameter and dimensions, the diverging curves of which take a wide circuit within the cranial cartilage, and terminate at both ends in this central cavity. These passages, from their situation and form, are called the anterior, posterior, and horizontal *semicircular canals*. Within the canals, in which the vestibular perilymph freely circulates, there are three similarly curved but more slender membranous elastic tubes: they are nowhere in contact with the sides of the canals, but are suspended in the midst of them by means of the cellular network above mentioned. They all swell out at one end like a flask (*ampulla*) as they enter the vestibule, after which the anterior and horizontal tubes separately enter a common pouch or *sinus;* into this their other ends likewise open by a conduit common to both. The posterior tube, which is the largest and longest, after forming its ampulla, resumes its former calibre, and passing along the floor of the vestibule under the largest *sac*, to which it is connected by the net-work, returns into itself, thus completing a separate circuit.

The fluid contents of the several membranous cavities do not communicate with each other or with the vestibular perilymph; though, as they lie in close apposition, their vibrations are mutually interchangeable.

The acoustic nerve is distributed in two principal branches only to the sacs and the ampullæ; chiefly to the latter, to which it gives a white colour. The filaments form a fine net-work on the outside of the ampullæ, and then piercing their parietes, are raised up within into a kind of crescentic screen, in order probably that they may be more exposed to the impulse of the vibrations descending along the aqueous endolymph of the semicircular tubes. All the parts we have described are transparent, except the opaque ampullæ and the solid cretaceous otolithes. We have been particular in our account of these membranous parts, which are found with little essential variation in all the superior animals, man included, because in the cartilaginous fishes they admit of more easy examination from their great size and firmer texture, and from the softness of the cartilage that encloses them. In man and the mammalia, they are not only much smaller and more delicate, but encased in the hardest bone in the body, from which it is almost impossible to separate them with sufficient accuracy to be certain that the description is correct.

In some cartilaginous fishes, as the sturgeon, the fenestra ovalis is not closed by a membrane, but by a round button-like piece of semi-transparent cartilage, called an *operculum*, or lid.†

The parts are similar in the osseous fishes, except that they have generally no fenestra ovalis.

In serpents there is but one sacculus containing chalky matter, and all the semicircular tubes communicate with a central membranous sinus, which the anterior and posterior tubes enter by a common trunk. The fenestra ovalis is closed, not as in fishes by a membrane, but by the expanded trumpet-shaped extremity of a slender bone (*ossiculum* or *columella*) attached at the other extremity by a ligament to the outer end of the intermaxillary bone.

Nearly the same arrangement of the *internal* ear prevails in the four-footed reptiles (turtle, crocodile, frog, lizard), but a new and important step is here made towards the ultimate perfection of the organ by the development of an air-cavity, called the *tympanum* or ear-drum, between the vestibule and the surface of the head. This addition, which, as we said, first becomes more than a mere rudiment in the four-footed reptiles, permits the vestibule to be placed with equal advantage at a comparatively greater depth, and thereby in greater security; but it has more important uses in rendering the sound more clear, and facilitating in several ways (to be presently explained) its communication to the auditory nerve. Like the musical instrument from which it takes its name, the tympanum is provided with a membrane tightly stretched upon the margin of a round opening in the outer part of its bony or cartilaginous wall; and it has an open vent or passage called after the anatomist who discovered it, the *Eustachian tube*, leading forwards from the cavity to the throat or back part of the nostrils, by means of which the air within it is adjusted to the variable state of the atmospheric pressure without. If the animal be amphibious, as many of the four-footed reptiles are, the membrana tympani is still covered entirely by integuments, sometimes, as in the crocodile, by a movable flap of the scaly hard skin, which can be raised up when the animal is out of the water: more frequently however the membrane lies entirely beneath the skin, here thinner than elsewhere on the head, as in the tortoise. The *lacerta agilis*, or basking lizard, alone, which lives entirely on the land, has the membrane naked to the air. In this class of animals the columella is not directed forwards to the angle of the jaw as in serpents, but is attached by a cartilaginous extremity to the centre of the membrana tympani, and thus conveys the collected effect of its vibrations directly to the fenestra ovalis: the effect of this arrangement in rendering the impression of sound more definite must be obvious. In some species the cartilaginous portion of the columella is joined to the bony portion at an acute angle, like the letter V, which adds an elasticity to the mechanism very serviceable as a protection to the delicate parts within the fenestra ovalis from the injury they might otherwise sustain by a blow or undue pressure upon the membrana tympani. This is the case with the lizard mentioned above, in which there is also a rudiment of the muscle which serves in the higher animals to tighten the membrane; a circumstance which makes this elbow in the columella a still more essential provision against sudden changes in the distance between the centre of the membrane and the fenestra ovalis. It is worthy of remark that in one class of serpents, the *cæciliæ* (blindworms), the ear is as complete as in any of the four-footed terrestrial reptiles; possessing a tympanum with two membranes, a Eustachian tube, and a columella bent to an angle. This departure from the usual rule in serpents appears to be one of those compensations so frequently met with in the animal kingdom, the organ of sight in the cæcilia being imperfectly developed.

In birds, besides a greater nicety and tenuity in the conformation of the parts hitherto described, the ear is furnished with two additional provisions, both probably of great consequence to the perfection of the organ. The first is a short *meatus auditorius externus*, or outer passage, which removes the delicate membrane of the tympanum to some depth from the surface of the head, and thus places it more securely, and at the same time, to greater advantage for observing the direction of sound. The other additional provision in birds is an appendage to the mechanism of the internal ear. This is a small conical cavity in the bone, somewhat curved, with a double spiral ridge winding round the interior, and enclosing a cartilaginous structure so corresponding in form with the ridge as to divide the cavity into two partitions. These communicate with another at the apex, and with the vestibule and tympanum respectively, at their other ends. The cavity is termed the *cochlea*, from its resemblance to a spiral shell; the partition communicating with the internal ear is the *scala* (winding stairs) of the vestibule; the other is the *scala tympani;* the opening from the latter into the tympanum is called the *foramen rotundum;* it is closed by a membrane to exclude the air of that cavity while it permits the transit of vibration to or from the vestibular perilymph within; for that fluid, passing up the cochlea by the scala vestibuli, descends the scala tympani, and bathes the inner surface of the membrane of the fenestra rotunda. The cartilaginous *newel* is kept in its place like the semicircular tubes by retiform filaments, and is supplied with a separate branch of the acoustic nerve, which ramifies and expands on its surface. The *lapilli,* which seem to be chiefly a provision for hearing under water, and are therefore large and solid in aquatic and amphibious animals, appear in birds only as fine crystallized grains of chalk in the *utricle,* or sinus of the vestibule, rendering the endolymph somewhat turbid. The columella is straight, and the membrana tympani pressed outwards by it is consequently convex. There is a crescentic fold of skin extending upwards from the superior margin of the meatus externus, sometimes furnished, as in the horned owl, with a fringe of feathers which can be spread at pleasure like a fan to catch the sound. This fold of skin is a rudiment of the *concha,* or outer ear, of the mammalia.

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* Scarpa de Auditu.

† This is also found in the aquatic salamander, which, as concerns the organ of hearing, may be considered as the link between fish and reptiles, resembling the latter in the arrangement of the labyrinth, but being unprovided with a tympanum or a columella.

As we have already said, it is only in this last-mentioned class of animals that the ear reaches its complete development. It is nearly the same in all of them; the difference being only in the comparative size and shape of the component parts of the organ, and not in their essential structure, number, or arrangement.

We shall therefore describe the organ in one species only.

There is every reason to suppose that in hearing, as in sight, man has no superiority over many of the lower animals except what arises from that intellectual supremacy which enables him to discriminate and compare his sensations more justly than they can do. Indeed, it is certain that in the mere perception of sounds he is inferior to most of the mammalia, and probably to birds; and if the musical faculty should seem to imply a greater perfection of the organ, the error, for such we believe it to be, may perhaps disappear upon reflection. We therefore select the human ear as the type of the organ in mammalia, not because it is in any respect more complete than the rest, but as the most interesting. The same description, of the more important parts at least, might be applied, nearly word for word, to all.

The parts now to be described fall naturally under a three-fold division into the internal, middle, and external ear.

1. The internal ear, comprising the acoustic nerve, vestibule, and labyrinth, is deeply placed in the interior of the head, within the most compact and hardest of the bones, denominated from that circumstance the *petrous* or rocky portion of the temporal bone. This wedge-like or triangular projection passes obliquely inward and forward in the direction of the outer tube of the ear, forming a strongly-marked knobby ridge within the cranium, in the basis or floor of that cavity. Near the inner point, which nearly meets its fellow on the other side, and upon its posterior declivity, there is a large trumpet-like hole (*meatus auditorius internus*) into which the seventh cerebral nerve enters from the *medulla oblongata.* [Brain, Nerve.] The meatus passes in a direction outwards, and therefore obliquely, into the petrous portion for half an inch, and then terminates abruptly in two *foveæ,* or pits: from the upper of these goes a winding canal through the substance of the bone, which is the course of the motor nerve of the face (the *portio dura* of the seventh pair), which, here separating from the auditory nerve, or *portio mollis,* we need not follow. The latter, splitting into several sets of filaments, finds its way through small sieve-like openings at the bottom of the lower fovea into the internal ear, and is here distributed in three separate portions to the cochlea, the ampullæ of the semicircular tubes, and the *utricle,* or vestibular sac. The cochlea is more complicated than in birds; it consists of a spiral canal in the bone, gradually diminishing as it ascends to a point, wound round a central hollow pillar of bone, called the *modiolus,* or newel. From its inner surface, that, namely, which may be considered as a groove in the modiolus, a thin and spongy lamella of bone projects rather more than half across the canal, ascending in a similar spiral. From the edge of this lamella (called the *lamina spiralis*) a membrane passes to the outer surface of the canal, where it is attached; thus completing the separation of the canal into two *scalæ,* or winding partitions, which unite at the summit, and open (as before), the lower and narrower into the vestibule, the superior and larger into the tympanum; each *scala* taking two turns and a half round the modiolus in ascending from the base of the cochlea to the cupola, or inverted cup-shaped cavity at the summit, placed over the funnel (*infundibulum*) into which the top of the modiolus expands. The cochlea is on a level with the vestibule and anterior to it, the base being turned towards the meatus internus; the summit looking outwards and a little downwards, is turned towards the sudden bend of the wide canal in the petrous portion of the temporal bone by which the internal carotid artery enters the cavity of the head. It is the close neighbourhood of this artery as it passes through the compact bone that occasions the rushing sound of the pulse to be heard when the ear is placed upon a pillow, or the attention is led to dwell upon what passes within, by deafness arising from some cause not affecting the parts essential to hearing. The modiolus is hollow to some distance from the base. Up this tubular cavity rises the large cochlear branch of the acoustic nerve, giving off lateral filaments through minute openings arranged spirally, which pass through the light spongy bone, and emerge from different points on the spiral floors and sides of the scalæ, where they ramify in a delicate pulpy expansion upon the membranous tubes which line the spiral osseous canals: the rest of the cochlear nerve passes through capillary perforations in the cul-de-sac of the tubular cavity; and ascending in the substance of the central pillar of the modiolus, is distributed through the bone in a similar way to the upper turns of the cochlea and the infundibulum. The two other branches of the acoustic nerve are distributed to the vestibular sac, which lies in a round depression or pit in the barrel-shaped cavity of the vestibule, and to the ampullæ of the semicircular tubes. The latter all meet in a membranous sinus, or utricle, which occupies another distinct pit of the vestibule, called, from its shape, the elliptic fovea, much according to the arrangement already described in other animals. The principal opening from the vestibule is the fenestra ovalis, situated on the outer side towards the tympanum, which is closed by a membrane; at the lower and front part there is another opening into the scala vestibuli of the cochlea. There are five at its posterior and outer side, which lead into the semicircular canals, of which the superior and posterior enter the vestibule by a common foramen. The sac and utricle each contain a cretaceous deposit, which, in some of the lower mammalia, has the consistence of soft chalk. The cochlea and semicircular canals, from their complexity, are termed the *labyrinth.* With respect to the object of their peculiar arrangement, not even a probable conjecture has been hazarded. Yet they appear with surprising uniformity in all the mammalia, and some of them, as we have seen, in the more numerous tribes of birds, reptiles, and fishes. The bony canals of the labyrinth and vestibule are stated to be invested within by a delicate periosteum, the surface of which towards the perilymph is thought to be of the nature of a serous membrane, and to secrete that fluid.

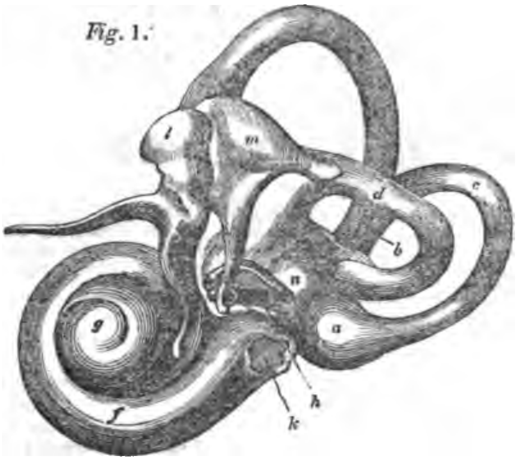

Fig. 1. Magnified view of the osseous labyrinth and vestibule as they would appear if the solid bone in which they are imbedded were removed, with the *ossicula auditûs* in situ. *a,* ampulla of the posterior semicircular canal; *b,* common tube by which this and the superior canal enter the vestibule, *c,* posterior canal; *d,* external canal; *e,* superior canal; *f,* cochlea; *g,* its cupola; *h,* fenestra ovalis covered by the stapes; *k,* fenestra rotunda *l,* malleus; *m,* incus; *n,* vestibule.

The deafness which arises from causes which affect the fenestra ovalis, or the nerves and canals within the vestibule and labyrinth, is seldom or never cured; and it is unfortunately very common. There is a very easy way by which the nature of the case may be often sufficiently tested. If the internal ear be affected, especially the nerves of it, the ticking of a watch pressed against the teeth or the outer part of the head on that side, will be very obscurely distinguished. If not, the sound can be easily heard, as the solid bones interposed between the sonorous body and the nerve are excellent conductors of vibration.

2. The *middle* ear comprises the cavity of the *tympanum*° with its contents; the cells in the bony prominence behind the ear, called the *mastoid process*, with which the tympanum communicates; and the Eustachian tube, or passage leading from the tympanum into the upper and back part of the throat, where it opens in the form of an expanded slit on each side behind the posterior nares.

The tympanum is an irregular cavity scooped in the petrous portion of the temporal bone between the vestibule and the external meatus. The principal entrances to it are the fenestra ovalis and the round or somewhat oval opening at the bottom of the external passage upon which the membrana tympana is stretched. Between these there is extended a chain of three small bones, obliquely articulated to each other with perfect joints, so placed that the chain somewhat resembles in figure the letter Z.

These bones are called respectively the *stapes* (stirrup), the *incus* (anvil), and *malleus* (hammer), from some similarity in form to those implements. The base of the stapes is applied to the fenestra ovalis, exactly fitting it, and is attached firmly to its membrane. The extremity of the longer leg of the incus is articulated to the head of the stapes, and there is a minute bone between them of the size of a small shot, which is generally considered to be only a process of the incus. It is however called from its spherical shape the *os orbiculare*, and is sometimes reckoned as a fourth bone. (*Fig*. 3, *o*.) The shorter leg of the incus (*fig*. 2, *c*,) rests against the bony parietes of the tympanum at the back part, near the mastoid cells. Upon the hollowed cavity in the head of the incus (*fig*. 2, *a*) the lateral depression of the head of the malleus (*fig*. 2, *k*) is articulated, and moves easily; the long handle of the latter is attached by its extremity (*fig*. 2, *h*) to the middle of the membrana tympani, as well as by a portion of the side of the handle, which lies close to and parallel with the membrane. The long slender process of the malleus called the *processus gracilis* (*fig*. 2. *g*) lies in a slit passing to the articulation of the jaw called the *glenoid* fissure.

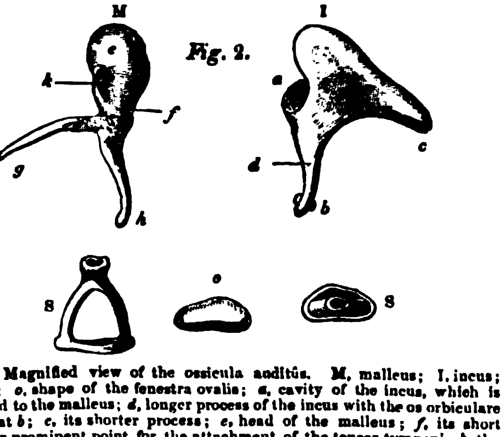

Fig. 2. Magnified view of the ossicula auditûs. M, malleus; I, incus; S, stapes; *o*, shape of the fenestra ovalis; *a*, cavity of the incus, which is articulated to the malleus; *d*, longer process of the incus with the os orbiculare attached at *b*; *c*, its shorter process; *e*, head of the malleus; *f*, its short process, or prominent point for the attachment of the tensor tympani; *k*, the depression which articulates with the incus; *g*, processus gracilis of the malleus; *h*, its handle, or manubrium.

Fig. 3.

Fig 3. The same bones of their natural size. *m*, malleus; *i*, incus; *s*, stapes; *o*, orbiculare.

The use of these bones is undoubtedly to transmit the vibrations of the membrana tympani to the membrane of e fenestra ovalis, and thence to the internal ear. But y have another use which would be incompatible with a gle bone passing between those membranes, as in birds and most reptiles; this is to permit the membrana tympani to be drawn into a conical shape so as to tighten it, and adapt it either to resist the impulse of too loud a sound, or favour a more acute or gentle one. The muscle which chiefly effects this object, called the *tensor tympani* (*fig*. 4, *a*), is attached near the head of the malleus to a point projecting from it. (*Fig*. 2, *f*.) Other muscles, to steady and antagonize its action, called the *laxator major* and *minor tympani*, are also attached to the malleus, the former (*fig*. 4, *b*) to the processus gracilis, the latter (*fig*. 4, *c*) to the handle of the bone. A further description of the directions and other attachments of these minute muscles would be tedious and unintelligible to the general reader. No muscle is attached to the incus, but a small one of great importance is inserted into the neck of the stapes, called the stapideus; the effect of this is to counteract the obliquity of traction or *tilting* of the stapes, which would otherwise ensue from the movements of the other bones; by this means the motion of the stapes is directed either immediately to or from the fenestra ovalis, the membrane of which is also further preserved from injury by the oblique arrangement of the joints of these minute bones, by means of which, although the membrane of the tympanum oscillates through a considerable space in passing from tension to relaxation, that of the fenestra is moved to a much smaller extent. It is to be observed that the same action which draws the membrana tympani into a cone thrusts the base of the stapes farther into the fenestra ovalis.

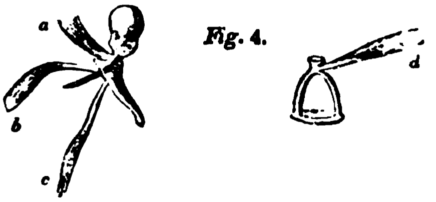

Fig. 4. Muscles attached to the *ossicula auditûs*. *a*, tensor tympani; *b*, laxator major; *c*, laxator minor; *d*, stapideus.

These small muscles are not under the dominion of the will, being supplied with nerves in a way peculiarly interesting to a physiologist, and acting automatically in correspondence with the impressions on the auditory nerve. Yet the instinctive consciousness we have of the degree of their coutractions in adjusting the tension of the membrana tympani to circumstances, is probably one of our chief means of estimating the intensity of sounds.

The fenestra ovalis is situated nearly opposite the membrana tympani, on the upper edge of a prominence called the *promontory*; it faces outwards and a little downwards, and beneath it, concealed by the promontory, is the foramen rotundum, closed by a membrane, and leading into the cochlea by the scala tympani. The object of this last opening is disputed: some think it conveys in part the vibrations of the air of the tympanum to the internal ear; but it seems more reasonable to suppose, with Sir C. Bell, that the end it chiefly serves is to give vent and freedom to those of the fluids pent up in the unyielding bony canals of the labyrinth. Besides these openings from the tympanum, there are others which lead into the mastoid cells behind it; these are also filled with air, and are supposed to contribute to the distinctness of the tympanic vibrations. There is also an opening from the tympanum forwards into the Eustachian tube. This canal is nearly two inches long; the first part of its course from the tympanum is bony; it then becomes cartilaginous, and widens as it approaches the throat, the mucous membrane of which lines it, and this passing into the tympanum, spreads over the surface of the whole cavity, investing the ossicula and its other contents, as well as the mastoid cells. From this circumstance arises the tendency of the inflammation of cold or sore throat to extend into the tympanum, producing temporary deafness, ear-ache, and sometimes mischief of a more permanent kind. From the deafness which accompanies the closure of the Eustachian tube by that or other causes, the importance of its functions in renewing and giving vent to the air within the tympanum may be appreciated. Besides the foramina already mentioned, there are others through which nerves and vessels enter the tympanum. We have not space to describe them: we shall only mention that one of the nerves, called the *chorda tympani*, originally connected with the *portio dura* of the seventh nerve, after traversing the petrous bone in a circuitous course, enters the cavity of the tympanum, and passing quite across it, is transmitted through the glenoid fissure to a salivary gland under the lower jaw. The object of this singular but uniform course of the chorda tympani is not well understood.

Deafness arising from closure of the Eustachian tube has been sometimes cured by dilating that canal by instruments passed for that purpose into its outer expanded extremity through the nostrils, or from the back of the throat; or by injecting fluids into it by means of a syringe with a small curved pipe. This latter plan has also been successful in curing deafness arising from chronic inflammation, or morbid secretion within the tympanum. Suppuration within that cavity, or in the mastoid cells, sometimes results from high inflammation, and has been attended with fatal consequences by spreading to the bones of the cranium, or along the nerves to the brain, or its membranes. Cases of this kind generally originate, as we have already stated, in cold with sore throat, and are found to occur chiefly in scrofulous habits.

Fig. 5.

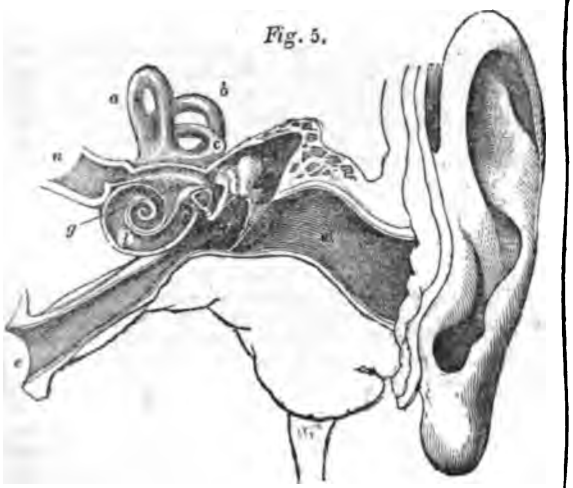

Fig. 5. This is not to be considered as a correct delineation of the organ, being intended only as a *diagram*, to give a general idea of the relative situations of the several parts. *a*, superior semi-circular canal; *b*, posterior ditto; *c*, external ditto; *d*, scala tympani of the cochlea opened, to show *r*, the fenestra rotunda, entering the tympanum under the promontory; *e*, Eustachian tube; *f*, membrana tympani; *g*, vestibule, not laid open; *m*, meatus auditorius externus; *n*, meatus internus, terminating in two *foveæ*.

3. The external ear consists of the *meatus auditorius externus* (*fig.* 5, *m*) and *concha*. The former, commencing from the membrana tympani, is an osseous canal in the first part of its course in the adult, and then becomes nothing more than a tubular continuation of the expanded cartilage of the concha, or outer appendage of the ear. It is lined throughout with a delicate skin, covered by thin cuticle, which also covers the outer surface of the membrane. Beneath the skin, and opening through it on the surface, are numerous glandular follicles which secrete the ear-wax or *cerumen*. In the fœtus and new-born infant there is hardly any appearance of this tube; the membrane of the tympanum being close to the surface of the head, stretched upon the inner margin of a bony ring (*annulus auditorius*) which afterwards increases in length and becomes a tube. In the adult the length of the whole tube may be nearly an inch; but from the obliquity of the membrane, which faces a little downwards, it is longer below than above. Its direction *from* the membrane is outwards and a little backwards, and it is slightly convex upwards, and rather narrower in the middle than elsewhere. The last mentioned peculiarity is the reason why it is so much easier to introduce beads and other round bodies (as children are apt to do) than to get them out. This however must always be done as soon as possible when such an accident happens; for the presence of the foreign body sometimes excites great inflammation and swelling, and may lead to very serious consequences. The most easy method and the least painful is to direct a strong stream of warm water into the tube with a syringe, which commonly succeeds immediately if resorted to before there is much swelling. Other means will readily suggest themselves; but if resorted to, they should be very tenderly used, for the part is extremely sensitive, especially the membrane itself, to rough contact. The wax, which is very bitter, serves to prevent the entrance of insects and to keep the skin soft. When secreted too abundantly, it is often a cause of deafness, and should be removed as a foreign body by means of a syringe and a solution of soap in warm water. The commonest kind of ear-ache is that caused by inflammation of this passage, and is generally followed by a copious and fœtid secretion poured out by the ceruminous follicles. If this last long, deafness is sometimes the result from thickening of the membrane, and has been removed, as well as that arising from closure of the Eustachian tube, by puncturing the membrane. This part is sometimes ruptured by the spasmodic action of the tensor muscle caused by loud sounds, or by driving air up the Eustachian tube in a forcible expiration, as in blowing the nose violently. This accident is not followed by the degree of deafness that might be expected, unless the stapes becomes displaced from the fenestra ovalis: the other ossicula may be lost with comparative impunity for obvious reasons.

Fig. 6.

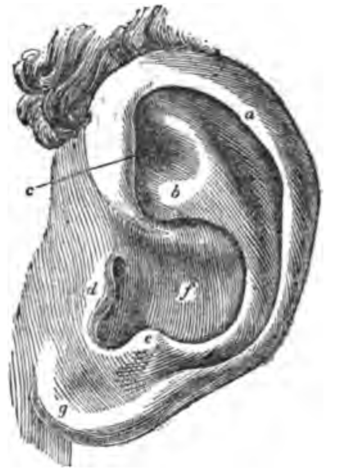

Fig. 6. View of the *pinna*, or *auricle*. The cartilaginous prominences are, *a*, helix; *b*, anti-helix; *d*, tragus; *e*, anti-tragus: the lobe or lobulus, *g*, contains no cartilage, being composed only of skin and a fatty cellular tissue. The depressions are *c*, the scapha or scaphoid (boat-like) fossa; and *f*, the concha, a term often used to denote the whole appendage of which it is the most important part.

The *concha*, or *pinna*, or *auricle* (for by all these names the outer appendage of the ear is known), consists of several pieces of elastic cartilage expanded in a form more or less resembling an ear-trumpet in different animals. In man it serves the purpose of collecting the sonorous vibrations and directing them into the meatus externus much less perfectly than in many other animals, which are also provided with muscles for directing it to the source of sound, which in man are but rudimentary. It is marked with various prominences and hollows, of which the names are given in the figure. It does not seem necessary to describe them more particularly. The cartilages are bound by ligaments to the neighbouring prominences of bone, and are covered by a smooth and closely adherent skin.

It may be observed that the aquatic mammalia (whales, porpoises, &c.) are unprovided with this part of the organ; and have a very narrow but long and curved meatus externus, passing obliquely into the surface of the head, and in some instances capable of being closed by a flap of movable skin to exclude the water. In these animals also the cochlea is imperfect, the scalæ making but one turn and a half round the modiolus.

(Scarpa, *de Auditu;* Soemmering, ditto; Breschet, ditto; Blainville, *Comp. Anat.;* Bell's *Anatomy;* Grant's *Outlines.*)

EAR-RING; a ring hung from a hole, perforated for that purpose through the ear, sometimes set with pendant jewels, pearls, or other precious stones. The word is Anglo-Saxon, *ear-hring*. Ornaments of this sort, large or small, have been worn in almost all countries by women, from the earliest ages; but more rarely by the men. Montfaucon says that the men, in many instances, wore them as amulets. In the Latin of the middle age ear-rings are termed *pendentes*, from the more common form of the ornaments usually attached to the ring itself. Sir Richard Hoare, in his antient Wiltshire, describes the ear-rings of a British female found in one of the barrows of that county.

EARL. The title of count or earl, in Latin *comes*, is the most antient and widely spread of the subordinate or subject titles. This dignity exists under various names in almost every country in Europe. By the English it is called earl, a name derived to us from the ealderman of the Anglo-Saxons and the eorle of the Danes. By the French it is called *comte*, by the Spaniards *conde*, and by the Germans *graf*, under which generic title are included several distinct degrees of rank,—landgraves, or counts of provinces, palsgraves, or counts palatine, of which there are two sorts, markgraves, or counts of marches, or frontiers, (whence marchio, or marquess), burghgraves, or counts of cities, counts of the empire, counts of territories, and several others. [COUNT; BARON.]

As to the English earls,—after the battle of Hastings, William the Conqueror, as it is well known, recompensed his followers with grants of the lands of the Saxon nobles who had fallen in the battle, to be held of himself as strict feuds; and having annexed the feudal title of earl to the counties of the Saxon earls (with whom the title was only official), he granted them to his principal captains.

These earldoms were of three kinds, all of which were by tenure. The first and highest was where the dignity was annexed to the seisin or possession of a whole county, with 'jura regalia.' In this case the county became a county palatine, or principality, and the person created earl of it acquired royal jurisdiction and seigniory. In short, a county palatine was a perfect feudal kingdom in itself, but held of a superior lord. The counties of Chester, Pembroke, Hexham, and Lancaster, and the bishopric of Durham, have, at different times, been made counties palatine; but it does not appear that the title of earl palatine was given to the most antient and distinguished of them, viz., the earl of Chester, before the time of Henry II., surnamed Fitz-Empress, when the title of palatine was probably introduced from the empire. The earls of Chester created barons and held parliaments, and had their justiciaries, chancellors, and barons of their exchequer. This county palatine reverted to the crown in the reign of Henry III. The second kind of earls were those whom the king created earls of a county, with civil and criminal jurisdiction, with a grant of the third part of the profits of the county court, but without giving them actual seisin of the county. The third kind was where the king erected a large tract of land into a county, and granted it with civil and criminal jurisdiction to be held *per servitium unius comitatûs*.

Under the early Norman kings, all earls, as well as barons, held their titles by the tenure of their counties and baronies; and the grant, or even purchase, with the licence of the sovereign of an earldom or a barony, would confer the title on the grantee or purchaser; but with the solitary exception of the earldom of Arundel, earldoms by tenure have long since disappeared, and in late times the title has been conferred by letters patent under the great seal. Earls have now no local jurisdiction, power or revenue, as a consequence of their title, which is no longer confined to the names of counties or even of places; for several earls, as Earl Spencer, Earl Grey, and others, have chosen their own names, instead of local titles.

The coronet of an English earl is of gold surmounted with pearls, which are placed at the extremity of raised points or rays, placed alternately with foliage. The form of their creation, which has latterly been superseded by the creation by letters patent, was by the king's girding on the sword of the intended earl, and placing his cap and coronet on his head and his mantle on his shoulders. The king styles all earls, as well as the other ranks of the higher nobility or peerage, his cousins. An earl is entitled right honourable, and takes precedence next after marquesses, and before all viscounts and barons. When a marquess has an earldom, his eldest son is called earl by courtesy; but notwithstanding this titular rank, he is only a commoner, unless he be summoned to the House of Lords by such title. So the eldest sons of dukes are called earls where their fathers have an earldom but no marquisate, as the duke of Norfolk, &c.

EARL MARSHAL OF ENGLAND, one of the great officers of state, who marshals and orders all great ceremonials, takes cognizance of all matters relating to honour, arms, and pedigree, and directs the proclamation of peace and war. The *curia militaris*, or court of chivalry, was formerly under his jurisdiction, and he is still the head of the heralds' office, or college of arms. Till the reign of Richard II., the possessors of this office were styled simply Marshals of England: the title of Earl Marshal was bestowed by that king in 1386 on Thomas Lord Mowbray, Earl of Nottingham. The office is now hereditary in the family of Howard, and is enjoyed by the duke of Norfolk. (Chamberlaine's *State of England*. Dallaway's *Inquiries into the Origin and Progress of Heraldry in England*, 4to., Glouc. 1793, pp. 93-95.)

EARSHELL. [HALIOTIDÆ.]

EARTH (Astronomy). In the language of astronomers, the earth is rarely treated as a planet. All the phenomena connected with its motion are seen in the apparent motion of the SUN, to which article we therefore refer.

EARTH, CONTROVERSY ON THE MOTION OF THE. [MOTION OF THE EARTH.]

EARTH, DENSITY OF THE. The fundamental experiment of Cavendish for the determination of this astronomical element being likely to be shortly repeated, it is advisable to defer this article: see therefore WEIGHT OF THE EARTH.

EARTH, FIGURE OF THE. [GEODESY.]

EARTH. The old chemists imagined that all material substances were ultimately resolvable into four simple bodies, viz. air, fire, water, and earth, which were then called the four elements. This term is still occasionally employed in a more restricted sense, as when mention is made of *earthy* salts, &c. It is now universally admitted that the bodies called earths are compounds of oxygen and a base, and in fact that they are mostly metallic oxides. The principal earths are alumina [ALUMINUM], barytes [BARIUM], glucina [GLUCINUM], lime [CALCIUM], magnesia [MAGNESIUM], silica [SILICIUM], strontia [STRONTIUM], yttria [YTTRIUM], zirconia [ZIRCONIUM].

EARTH-NUTS are either the fruit of certain plants which bury it below the ground after the flowering is past, as the Arachis hypogæa, Lathyrus amphicarpos, and others, or else the subterranean tubercles of fleshy-rooted plants, such as Bulbocastanum, Cyclamen, Lathyrus tuberosus, Apios tuberosa, and the like.

EARTHENWARE. The art of moulding earthen vessels for domestic use appears to have been practised in the earliest ages, and undoubtedly has been known among the rudest nations. The most antient records allude to the potter's wheel, and we have proof that great skill had been acquired in the manufacture of porcelain of a superior quality in China and in Japan at a very remote date. The little figures, covered with a fine deep-blue glaze, which are deposited with Egyptian mummies, and numerous jars, some specimens of which may be seen in the British Museum, show that in Egypt likewise the art was anciently practised; and indeed we see in Egyptian paintings representations of vessels (presumed to be earthen) which closely resemble those made in Egypt at present, and also the representations of the manufacturing process itself. (*Library of Entertaining Knowledge*, Egypt, ii. 179.) [COOLERS.] It has been supposed that the Britons understood the potter's art before the Roman occupation of this island, since urns of earthenware have been found in barrows in different parts of the kingdom; but other writers affirm, though we believe without proof, that our ancestors were in those days supplied with such articles by the Phœnicians. Vestiges of considerable Roman potteries have been discovered in many parts of this island, particularly in Staffordshire, and there is an interesting account by Governor Pownall (*Archæologia*, 5th vol., p. 282, &c.) of the discovery of numerous vessels of pottery which were fished up in the Queen's Channel, near Margate. It was for some time supposed that a Roman trading vessel, freighted with pottery, had been wrecked at this place; but on a more particular examination of the spot, called by the fishermen Puddingpan Sand, Roman bricks cemented together, apparently the ruins of a building, were likewise discovered, and on further investigation it was found that an island existed formerly on this spot on which there had been a large pottery established by the Romans. Many of the earthen pans were recovered in a perfect state, and several of them had the name of Attilianus neatly impressed upon them. The island has long since disappeared, but specimens of the manufacture carried on there were frequently drawn up during the last century in the nets of the Kentish fishermen.

In newly-discovered countries it has been found that the use of earthen vessels is familiar among people otherwise little acquainted with the arts of civilized life. Vases have been found among the aboriginal Indians on the Mosquito shore which were preserved as memorials of antiquity; and there is strong evidence for believing that these vessels were the manufacture of the country in which they were found, since the remains of antient potteries have been discovered at a considerable distance up the Black River on that coast. In the United States of North America also fragments of pottery made by the native Indians have often been discovered.

Although earthenware may be considered as a general term applicable to all utensils composed of earthen materials, it is usual to distinguish such utensils more particularly into three different kinds; namely,—pottery, earthenware, and porcelain. Under the first of these terms are classed the brown stone-ware made into jugs, &c., the red pans and pots in common use, porous vessels, &c. [Pottery.] Porcelain is distinguished from earthenware as being a semi-vitrified compound, in which one portion remains infusible at the greatest heat to which it can be exposed, while the other portion vitrifies at a certain heat, and thus intimately combines with and envelops the infusible part, producing a smooth, compact, shining, and semi-transparent substance, well known as the characteristic of true porcelain. [Porcelain.] At present our notice will be confined to earthenware as used in its distinctive meaning.

Until the beginning of the eighteenth century the manufacture of earthenware in this country was confined to a few objects of the coarsest description, and till nearly the close of the same century, the porcelain of China was still in common use on the tables of the wealthy, the home manufacture being confined to articles of the commonest domestic use. Earthenware was likewise largely imported from Holland, and superior kinds from Germany and France. English earthenware and porcelain are now not only brought into general use in this country, to the exclusion of all foreign goods, but earthenware is also largely exported to almost every part of the known world, and even to those countries where the art was previously prosecuted. M. Faujas de Saint Fond observes on this subject—'Its excellent workmanship, its solidity, the advantage which it possesses of sustaining the action of fire, its fine glaze impenetrable to acids, the beauty and convenience of its form, and the cheapness of its price, have given rise to a commerce so active and so universal, that in travelling from Paris to Petersburg, from Amsterdam to the furthest part of Sweden, and from Dunkirk to the extremity of the south of France, one is served at every inn upon English ware. Spain, Portugal, and Italy are supplied with it; and vessels are loaded with it for the East Indies, the West Indies, and the continent of America.' England is mainly indebted to Mr. Wedgwood for the extraordinary improvement and rapid extension of this branch of industry. Before his time our potteries produced only inferior fabrics, easily broken or injured, and totally devoid of taste as to form and ornaments. Wedgwood's success was not the result of any fortunate discovery accidentally made, but was due to patient investigation and unremitting efforts. He called upon a higher class of men than had usually been employed in this manufacture to assist in his labours, and in prosecuting his experiments he was guided by sound scientific principles. The early and signal success which crowned his first exertions only served as an additional motive for continuing his pursuit. One of the principal inventions of Mr. Wedgwood was his *table ware*, known at present as *queen's ware*, in consequence of the patronage of the queen, who commanded it to be thus designated. It is characterised as a dense and durable substance, covered with a brilliant glaze, and capable of bearing uninjured sudden alternations of heat and cold. From its first introduction, it was manufactured at so cheap a rate as to render it an article within the reach of all. Soon after, embellishments were introduced which very little enhanced the cost of the article; first, a coloured edge, or painted border was added to the queen's ware, and, lastly, printed patterns covering the whole surface, which at first exhibited very little taste, but by degrees reached the perfection which the art has now attained. Mr. Wedgwood's more beautiful inventions were—a *terra cotta*, which could be made to resemble porphyry, granite, Egyptian pebble, and other beautiful stones of the silicious or crystalline kind: a black porcelainous biscuit, very much resembling basalt in its properties, and therefore called *basaltes*: a white and a cane-coloured porcelain biscuit, both smooth and of a wax-like appearance; and another white porcelainous biscuit, distinguished as jasper, having in general all the properties of the basaltes, with a very important addition, the capability of receiving through its whole substance from the admixture of metallic oxides, the same colours as those oxides communicate to glass or enamel in fusion. This peculiar property renders it applicable to the production of cameos and all subjects required to be shown in bas-relief, as the ground can be made of any colour while the raised figures are of the purest white. Mr. Wedgwood likewise invented a *porcelain biscuit* nearly as hard as agate, which will resist the action of all corrosive substances, and is consequently peculiarly well adapted for mortars in the chemist's laboratory.

The principal ingredients employed in the composition of all kinds of pottery are clay and flint. The nature of the clay used in the manufacture is of great importance, and so also is the combining of it with a due proportion of flint. The clay principally used in the English potteries is obtained from Dorsetshire and Devonshire; that from the former county is brought from the Isle of Purbeck, and is considered superior to the Devonshire clay. It is of two kinds, distinguished as brown clay and blue clay. The clay from Devonshire is likewise of two distinct qualities, and known as black clay and cracking clay. All these clays are of good working quality, and burn extremely white, being free from any impregnation of iron: the blue clay is considered the best. Another description of clay, superior to either of the former, was first discovered in Cornwall by Mr. Cookworthy, in 1768, and is commonly denominated China clay, because similar in its properties to the porcelain earth of China. It is very white and unctuous, and on investigation has been found to be formed by the gradual disintegration of the felspar of granite. This Cornwall clay is prepared on the spot where it occurs. The partially decomposed granite is broken into small pieces, and thrown into a running stream, where the argillaceous parts are washed off and held suspended in the water, while the mica and quartz being heavier remain at the bottom. At the end of the stream the water is stopped by a dam, and the pure clay gradually subsides. When the whole has separated itself from the water, the latter is drawn off and the solid matter dug out in blocks, which are placed in a situation exposed to a free current of air, and when sufficiently dry are packed in casks for shipment in the state of a fine smooth white powder. Mr. Wedgwood found by analysis that this substance contains sixty parts of alumina and twenty parts of silica; it is infusible,* and remains unaltered in the greatest heat of a porcelain furnace. The price of this material is much higher than that of the other English clay; but in the making of porcelain it is indispensable, and it is also used in some of the finer kinds of earthenware.

Preparation.—In the preparation of the clay some labour is required, before it is in a fit state to be combined with the flint. It is first mixed with very pure water to the consistence of cream: this work is called *blunging*, and in large establishments is performed by means of machinery. The result is a smooth pulp, which is then passed through a series of sieves of increasing degrees of fineness, till at length it is perfectly fitted to enter into the composition of the ware. If the clay were moulded and dried without the addition of any other body it would certainly crack, as the evaporation of the water with which it is mixed, in order to render it sufficiently plastic for the potter's wheel, would cause it to shrink in the proportion of one part in twelve in drying. In combination with silicious earth in proper proportions, it bears the action of fire without cracking, while the silica materially improves the whiteness of the ware.

The flints are prepared by being burnt in a kiln, and removed while red-hot from the kiln and thrown into cold water. By this operation their attraction of aggregation is lessened, and the labour of grinding them is much facilitated. They are then broken and ground to a very fine powder in a mill constructed for the purpose, the original of which was invented by Brindley. A quantity of water is thrown into the mill with the flints, by which the process is quickened and the health of the workmen is preserved, the finer particles of flint being thus prevented from flying off and mixing with the atmosphere which the workmen inhale.

* The fusible quality of felspar is owing to the presence of about an eighth part of potass. This alkali is separated by decomposition, and thus the felspar being deprived of it becomes infusible, as is the case with this China clay.

The flints, when reduced to powder, are transferred from the mill into another vessel, where more water is added, and the whole is violently agitated by mechanical means; the finer parts are in consequence held in suspension above, and in this state are passed into a reservoir, while the grosser particles are left behind at the bottom of the vat. After subsidence, the supernatant water is drawn off from the reservoir, and the pulverized flint is in a fit state for use. It is considered of a proper fluidity for mixing with the clay when a pint weighs 32 oz., while an equal measure of the diluted clay should weigh 24 oz. The proportions in which the clay and flint are mixed vary with the quality of the clay, with the nature of the ware to be produced, and also with the practice of each manufacturer. Parkes, in his ‘Essay on the Making of Earthenware,’ &c., though his knowledge was obtained by a residence of some years at the seat of manufacture, does not give any precise information on the subject, but states that flint forms a fourth, a fifth, or a sixth part by weight of the prepared paste. The dilutions of clay and flint being brought together in suitable proportions, are intimately mixed by agitation, and passed, while in a state of semi-fluidity, through different sieves, whereby the whole becomes a smooth homogeneous mass. This mixture, technically called *slip*, is then very carefully evaporated, the mass being frequently stirred and turned over lest a part should become improperly hardened while the remainder continues too fluid. When the clay or paste is removed from the *slip-kiln*, it is well incorporated together by beating it with wooden mallets, in order to expel the air which it contains. The next operation is cutting it into small pieces, which are thrown together again with all the strength of the workmen; and this process is continued until the mass is considered in a complete state of consistence. When in this state it should be allowed to remain for a considerable period before being used, since it becomes more intimately united by time than by any mechanical means.

The paste, when taken for use, undergoes the process of *slapping*, which is similar in its effect to the last operation, and should incorporate the whole mass so completely, that wherever it is cut, it should exhibit a perfectly smooth and uniformly close appearance. The clay, being thus prepared, is now in a fit state for forming into ware. The processes for this purpose are of three different kinds—throwing, pressing, and casting, which are respectively employed according to the form of the article required.

The operation of throwing is performed upon a machine called a potter's lathe, and is used in shaping vessels which have a circular form. By this means the *thrower* moulds the clay into the form which he desires; and when finished to his satisfaction, he removes his work to a board or shelf, where it is left to dry partially; and when in a particular state of hardness, called the *green state*, well known to the operator, the vessel is in proper order for being further smoothed and shaped in the *turning-lathe*, and for being furnished with handles, spouts, or any other addition. The turning-lathe is similar to that used by the turner in wood, and by means of it rings, rims, &c. are formed on the vessels. For making dishes, plates, and other similar shallow vessels, a plaster mould is used, which is placed on the block at the top of the upright spindle of the lathe, and the workman continues the process in nearly a similar manner as in throwing. When sufficiently dry to be taken from the mould, the edges are pared with a sharp knife, and the vessels are placed in piles and left to harden, preparatory to their being baked.

A machine called an *engine-lathe*, which has a horizontal movement backwards and forwards, in addition to the rotary motion, is used in giving to earthenware a milled edge. Handles, spouts, &c. are fixed on the vessels as soon as they are taken out of the turning-lathe. They are affixed by means of slip, with which the parts designed to come in contact are moistened: in a short time, when dry, the union of the parts is found to be perfect. Handles, &c. are made by pressure in a small metallic cylinder, which has an aperture in the centre of its bottom, to which plugs of various shaped orifices are fitted. There is likewise a piston, so fixed as to be worked by a screw up and down the cylinder. The cylinder, being filled with clay, the piston is inserted, and forces the clay through the orifice at the bottom, and consequently gives it the same form as the aperture through which it was pressed. Being then cut into lengths and bent to the desired shape, the clay is ready, when sufficiently dry, to be joined to the vessel. For ornamental spouts, small ornaments, and other appendages of the like nature, the clay is pressed in moulds, the particular mode of doing which may be readily conceived.

When the vessels are sufficiently dry they have to be submitted to the action of fire. For this purpose they are placed in deep boxes called *seggars*, made of a mixture of fire-clay and old ground seggars, and capable of sustaining the most intense degree of heat without being fused. The seggars are of various sizes, shapes, and depths, adapted to the different pieces which they are to contain. In no case is one piece placed in or on another in the seggar, and each is so arranged that the heat may be equally applied to every part of each. The seggars, with their contents, are then disposed in the oven in such a way that the heat may be distributed fairly throughout: they are built one layer on the top of another until they reach nearly to the top of the oven, each seggar forming a cover to the one beneath it, and the upper seggar in each pile being always empty. The oven is of a cylindrical form, and very similar to the common kilns used for burning tiles. The process of baking usually lasts from forty-eight to fifty hours, during which time the heat is gradually increased, as it would be injurious to the ware to apply a very high degree at first. To ascertain when the baking has been carried far enough, the workman uses tests of common Staffordshire fire-clay, the pyrometer of Wedgwood having been long laid aside. [PYROMETER.] When the appearance is considered satisfactory the firing is discontinued, and the oven is suffered gradually to cool during twenty-four or thirty hours before the contents are taken out. The ware in this state is called *biscuit*. The glaze is now applied; the pieces are again placed in seggars, and conveyed to the glass-oven, where heat is applied to them of sufficient intenseness to fuse the glaze; but the heat must by no means be so great as that to which the *biscuit* has previously been exposed, as the glaze would crack or peel off if the vessels were liable to any further shrinking.

The glaze generally used for common kinds of earthenware is a compound of litharge and ground flints, in the proportion of ten pounds of the first to four pounds of the latter. This method of glazing is however highly objectionable on account of its injurious effects on the health of the workman, while the lead being soluble by acids, makes a most pernicious glaze for vessels which are used for containing many articles of prepared food. Glazes for porcelain and the finer kinds of earthenware are generally made with white lead, ground flints, ground flint-glass, and common salt. But almost every manufacturer uses a peculiar glaze of his own, the manner of making which he keeps in as much mystery as possible. Some glazes are made without the admixture of any lead, and in the whole of the better glazes this ingredient enters in so small a quantity as not to be injurious. The manner of applying the glaze is, to reduce the ingredients to powder, mix them with water to the consistence of cream, and then merely dip the pieces into the preparation and withdraw them immediately, taking care that all the parts have been wetted with the glaze.

When the earthenware is to be printed it undergoes this process previously to glazing. It is thus performed:—the landscape or pattern is engraved upon copper, and the desired colour being mixed with linseed-oil, is laid on the plate, and impressions are taken off on tissue-paper, in the manner usually employed by copper-plate printers. The paper, wet with the colour, has then all the blank parts cut away, leaving only the pattern entire, which is applied lightly to the ware when in the state of biscuit. It is then rubbed with a piece of woollen cloth, and rolled tightly in the form of a cylinder, till the colour is pressed sufficiently into the ware. In this state the whole is left for an hour, when it is placed in a cistern of water, so that the paper becomes sufficiently moistened to peel off readily, having transferred to the biscuit the colour and impression which it had received from the copper-plate. When the pieces thus printed are sufficiently dry they are placed in an oven and exposed to a gentle heat, in order to dissipate the oil: they are then in a fit state to receive the glaze. Till within the last few years, blue produced from the oxide of cobalt was the only colour employed, but at present many other colours are printed with equal facility.

The art of painting on earthenware more particularly applies to porcelain: the description of the colours used, which are all metallic oxides, and the manner of applying fore, therefore, more properly belong to the article under that head, as well as the method of gilding porcelain. Gold and silver lustre ware is commonly of an inferior quality. The metallic oxides used for this purpose are intimately mixed with some essential oil, and then brushed evenly over the surface of the vessel; the heat of the enamelling oven dissipates the oxygen, and restores the oxides to their metallic state, but with their brilliancy somewhat diminished.

The principal seat of the manufacture of earthenware in England is in Staffordshire, about [illegible] miles from the borders of Cheshire. The district, known as 'The Potteries,' extends through a distance of more than seven miles, in which there are towns and villages so thickly built and so close to each other that to a stranger the whole appears one large straggling town. There are likewise extensive manufactures of earthenware and porcelain in Yorkshire, and Worcestershire. There are establishments for making the commoner kinds of ware in many parts of the kingdom. By the evidence given by Mr. Wedgwood before a committee of the Privy Council in 1785, it is stated that the manufacturing part alone in the Potteries and their immediate vicinity gives bread to 15,000 or 20,000 people; yet this is but a small part when compared with the whole number of those who depend upon it. A very great number of persons are employed in raising the raw material and the coals for fuel, in the conveyance of these materials to the Potteries, and in the re-conveyance of the finished goods to every part of England and to the different ports where they are shipped for foreign consumption.

The number of pieces of earthenware of English manufacture exported, and the real value of the same in each year, from 1831 to 1835, were as follows:—

	Pieces.	Value.
1831	32,028,757	£461,090
1832	42,263,198	409,787
1833	40,289,210	496,964
1834	44,016,624	454,882
1835	45,020,136	540,421

Shipments of these goods are made to every country with which Great Britain has any trading relations. The exports in 1835 were sent to various quarters in the following proportions:—

	Pieces.	Value.
Northern Europe, chiefly to Germany and the Netherlands	7,214,213	£85,716
Southern Europe, chiefly Portugal, Spain, and Italy	3,202,970	42,738
Africa	845,693	19,180
Asia, chiefly East India Company's territories, islands of the Indian Seas, and New South Wales	2,284,611	30,563
United States of America	17,521,271	246,220
Other parts of North America, chiefly British colonies	6,796,138	74,183
Brazil	6,060,103	42,123
Other States of South and Central America	2,049,043	24,545
Guernsey, Jersey, Alderney, &c.	332,022	4,193
Pieces	45,993,446	£549,421

EARTHQUAKES are the most terrible of all natural phenomena. The solid surface of the globe is put in motion by them, and assumes an appearance which in some cases may be compared with the sea when agitated by the wind.

The least dangerous of these phenomena are those which by the Creoles of South America are called *Tremblores*, a term which may be translated by *tremors*. The surface of the earth is put in a trembling motion, by which such objects as are not well supported are thrown to the ground, and even walls are split, but the damage does not extend further. Life is safe, and property but slightly injured. These tremors are by far the most common kind of earthquakes, and occur in some countries of South America, especially in Chile, almost every day, at least in certain seasons.

The *terremotos* of the Creoles, or proper earthquakes, give to the surface either horizontal oscillations, not dissimilar to the waves of an agitated sea, or they consist in violent perpendicular upliftings, so that it would seem as if confined vapours were exerting their force against the roof of a subterraneous cavern, threatening to burst it open and to throw into the air every thing placed over it. By these movements walls are overthrown, and fissures are produced in the ground. The latter are frequently more than a foot in width, and sometimes water gushes out of them like a torrent.

Nothing makes such an awful impression on the senses as an earthquake. The earth is violently convulsed, heaving up and down in a manner hardly conceivable by those who have not witnessed it. The tottering buildings, the cracking of the timbers of the roofs, and the falling of the tiles, completely distract the senses. Fear drives men from their houses; but they do not always find safety out of doors. No person can stand without support; people cling to one another, to trees, or to posts. Some throw themselves on the ground; but the motion of the earth is so violent that they are obliged to stretch out their arms on each side to prevent themselves from being tossed over. Animals are equally alarmed. They stand with their legs spread out and their heads down, trembling violently. The air itself seems to participate in the convulsion, for the birds fly about wildly. Meanwhile the sea retires from the shore; but after a few minutes it returns in a high wave, which advances like a watery wall with incredible velocity, and covers all those tracts which are not more than fifty feet above high-water mark. It rushes back with equal velocity. This motion of the sea is repeated as long as the shocks of the earthquake are violent. Vessels sailing along a coast convulsed by an earthquake feel also a motion quite different from that produced by gales or currents. The loss of life by earthquakes is sometimes considerable. It is chiefly produced by the falling of the buildings when the shock is so unexpected that the inhabitants have not time to escape. In some cases the overflowing of the sea has been fatal to a great number of persons. People have also been swallowed up by the fissures caused by earthquakes.

Earthquakes are generally preceded and sometimes attended by a subterraneous noise, which is compared by some to that of a very heavy artillery waggon rolling quickly over a stone pavement at a distance; by others, to the echo of distant thunder in a mountainous country. It is worthy of remark that this noise is sometimes heard without any earthquake taking place, as in 1784 at Guanaxuato, in Mexico, and that it has been as audible in places situated at a considerable distance from the seat of the earthquake as in those which experienced the shocks. There are also several cases on record in which the earthquakes have not been attended by such subterraneous noise.

Considerable changes may be produced on the surface of the globe by earthquakes. It is said that by the earthquake of 1783 in Calabria some mountains changed their relative positions to one another; but this fact is not well established. It is, however, beyond all doubt that the coast of Chile has undergone a considerable change by earthquakes during the last fifteen years. In 1822 the coast, north of Valparaiso, to the extent of fifty miles, was raised nearly three feet above its former level; in some places the rocks on the shore were raised four feet. In 1835 the island of S. Maria (near 37° S. lat.) was upheaved nine feet, so that the southern part of this island has almost been destroyed, and the soundings round the island have diminished a fathom and a half every where.

The single shocks of an earthquake last from a few seconds to two or three minutes. Sometimes they follow one another at short intervals. It is remarkable that generally either the first or one of the first shocks is the most violent, and that they afterwards gradually decrease in force. Sometimes they return for several days, and even weeks; and in some places, as at Copiapó, in Chile, they are of daily occurrence.

Earthquakes are sometimes experienced over an immense tract of country. The last earthquake in Chile (in 1835) was felt at all places between the Island of Chiloe (40° S. lat.) and Copiapó (27° S. lat.); consequently over thirteen degrees of latitude. It extended from the Island of Juan Fernandez to the town of Mendoza, on the east side of the range of the Andes, over ten degrees of longitude. But when earthquakes extend over such an immense tract of country, some districts are always convulsed with greater violence, and these may be considered as the centre of the earthquake. The farther a place is removed from these centres, the less violent, as a general rule, are the shocks.

We know little, or rather nothing, of the origin or cause of earthquakes. It may, however, be considered as certain that they are due to the same agency which produces volcanic eruptions. These eruptions are frequently preceded by earthquakes; and whenever, in places situated near active volcanoes, it is observed that no smoke issues from their craters, the inhabitants begin to fear the approach of an earthquake.

It is not quite certain whether or not there is any connexion between the state of the atmosphere and the phænomena of earthquakes. It is not improbable that such is the case with the slighter shocks, the *tremblores*. They commonly occur, or at least are by far most frequent, at the time of the changes of the seasons, in Guatemala as well as in Chile. But the more violent concussions seem to be quite independent of the seasons, and they occur both in calm and cloudless weather and in storms and during rain. In some instances they have been preceded by luminous meteors.

Antient authors, especially Thucydides, frequently mention earthquakes; but only in general terms. Yet we learn enough from these slight notices to show that they were often equal in violence to those which in modern times have convulsed the continent of Europe and Asia. (Thucyd. i. 101; iii. 89; v. 50; viii. 41.) No detailed description of an earthquake in Europe or in the old continent exists before that which, on the 1st of November, 1755, almost destroyed the city of Lisbon. This is the most destructive earthquake which has ever occurred in Europe. The number of persons that perished by it is stated to have been 30,000. In February and March, 1783, the north-eastern part of Sicily and the southern portion of Calabria were convulsed by repeated and very violent shocks, which overthrew the town of Messina, and killed many thousands of its inhabitants, as well as many persons in Calabria. The last considerable earthquake in Europe extended over the middle of the kingdom of Naples, and was most destructive in the districts lying along the declivities of Mount Matese. (41° 30′ N. lat.) The number of persons who perished by it amounted to 3274, besides 1615 who were wounded.

On the first day of the present year (1837) the countries along the eastern extremity of the Mediterranean, especially Syria, were violently agitated by an earthquake. The towns of Damascus, Acre, Tyre, and Sidon, suffered great damage, and Tiberias and Safet were entirely destroyed. It is stated that about 6000 lives were lost.

America is more subject to earthquakes than any portion of the Old Continent, but they are only strongly felt between 20° N. lat. and 40° S. lat; and it is not the whole country included between these latitudes that is visited by them, but only the table-lands of the Mexican isthmus, the Andes, and the countries bordering on them, and those which are adjacent to the Caribbean Sea. Mention of earthquakes in these countries occurs in the Spanish historians of the Conquest; but it would seem as if the earthquakes were less destructive formerly than in the last century. In 1717 the town of Guatemala was greatly damaged by an earthquake on the 29th of September; and on the 29th of June, 1773, the town was almost entirely destroyed. Caracas was destroyed by an earthquake on the 26th of March, 1812, when upwards of 12,000 of its inhabitants were buried in the ruins; and the same town experienced, in 1826, another earthquake, which was hardly less destructive. Bogotà experienced a very severe shock in 1827. On the table-land of Quito violent earthquakes are frequent. In 1698, on the 20th of June, Lacatunga and Hambato were destroyed; and on the 4th of February, 1797, the town of Quito was greatly damaged, and Riobamba levelled to the ground. Not less than 40,000 persons are stated to have perished by this last earthquake on the table-land. Lima and the countries about it are likewise subject to frequent and violent earthquakes. The town of Lima was almost entirely destroyed on the 20th October, 1687, and again on the 28th October, 1746. In this latter catastrophe the port of Callao was inundated by the sea, and the whole population perished. Arequipa has had its share of earthquakes; but the last violent one occurred in 1725. Copiapò was destroyed on the 11th of April, 1819, and again in 1822. By this last earthquake, which happened on the 19th of November, the town of Valparaiso was levelled to the ground. Santiago has suffered largely from the destructive effects of the earthquakes so frequent in Chile: on the 8th of July, 1730, it sustained great damages. But no place in Chile has so frequently been destroyed as Concepcion. It was first destroyed by the united effects of repeated shocks and the inundation of the sea in 1730, and again in the same manner in 1751. After this the town was rebuilt on another site; but this new town and its port of Talcahuano were entirely demolished on the [illegible] of February, 1835. A most graphic description of this dreadful earthquake is given in the 'London Geographical Journal,' vol. vi. p. 319, &c., to which we are much indebted for several valuable facts and remarks. The inundation of the sea during this calamity may be compared with the narrative of a similar event recorded by Thucydides (iii [illegible]).

EARWIG. [Forficulidæ.]

EASEL (derived by some from the Teutonic *asel*, or [illegible] an ass), the wooden frame, furnished with a set of movable pegs, or more convenient sliding ledge, on which pictures are placed while being painted, and which raises or lowers them according to the artist's convenience. Its antiquity is manifest, from its appearance in pictures discovered in Herculaneum.

EASEMENT (from the French words *aise*, [illegible] ease), is defined by the old law writers as a service or convenience which one neighbour hath of another by charter or prescription without profit; as a way through his ground, a sink, or the like. It includes rights of common, way, water-courses, antient lights, and various other franchises issuing out of corporeal hereditaments, and sometimes, though inaccurately, applied to rights of common. (K[illegible] Woodd. *Lect.*)

At the common law these privileges (which can only be created and transferred by deed) might be claimed either under an immemorial custom or by prescription: but [illegible] years uninterrupted and unexplained enjoyment of an easement formerly constituted sufficient evidence for a jury to presume that it originated in a grant by deed; except in the city of London, where the presumption of a grant from 20 years' possession of windows was excluded by the custom which required that there should exist 'some written instrument or record of an agreement.' Non-user during the same period was also considered an extinguishment of the right, as raising a presumption that it had been released.

By the recent statute 2nd and 3rd William IV., cap. [illegible], several important alterations have been made with regard to this description of property: 40 years' enjoyment of a way or other easement, or any water-course, and 20 years' uninterrupted 'access and use of any light to and for any dwelling-house,' &c., now constitute an indefeasible title in the occupier, unless he enjoys 'by some consent or agreement expressly given or made for that purpose by deed or writing.' The same statute also enacts that non-user for the like number of years (according to the description of the particular right) shall preclude a litigating party from establishing his claim to it.

The easements of the English correspond to the Servitutes of the Roman and the Servitudes of the French law. The servitutes were a class of rights which gave rise to numerous complicated questions. Those of road, water, light, drains, were the principal. (*Dig.* lib. viii. *De Servitutibus*; *Code Civil des Français*, liv. ii. tit. 4, *Des Servitudes*.)

EAST, the point of the compass which is in a direction at right-angles to that of north and south, and which is towards the *right* hand of a spectator who faces the north. The distinction between east and west must ultimately be derived from a reference to the human body; for we can only define a spectator's *right* hand by saying that it is the hand which is not upon the same side as the heart.

EAST INDIA COMPANY. This association originated from the subscriptions, trifling in amount, of a few private individuals. It gradually became a commercial body with gigantic means, and next, by the force of unforeseen circumstances, assumed the form of a sovereign power, while those by whom it was directed continued in their individual capacities to be without power or political influence; thus presenting an anomaly without a parallel in the history of the world.

The company was first formed in London in 1599, when its capital, amounting to 30,000*l*., was divided into 101 shares. At the end of the next year the adventurers obtained a charter from the crown, under which they enjoyed exclusive privileges, and were formed into a corporation for [illegible] years under the title of 'The Governor and Company of Merchants of London trading to the East Indies.' Under this charter the management of the company's affairs was intrusted to 24 members of a committee chosen by the proprietors from among their own body, and this committee was renewed by election every year.

The first adventure of the association was commenced in 1601. In the month of May of that year, five ships, with cargoes of merchandise and bullion, sailed from Torbay to India. The result was encouraging, and between 1603 and 1613 eight other voyages were performed, all of which were highly profitable, with the exception of the one undertaken in the year 1607. In the other years the clear profits of the trade varied from 100 to 200 per cent. upon the capital employed. At this time the trading of the company was not confined to the joint stock of the corporation, but other adventurers were admitted, who subscribed the sums required to complete the lading of the ships, and received back the amount, together with their share of the profits, at the termination of every voyage.

The charter of the company was renewed for an indefinite period in 1609, subject to dissolution on the part of the government upon giving three years' notice to that effect. In 1611 the company obtained permission from the Mogul to establish factories at Surat, Ahmedabad, Cambaya, and Goga, in consideration of which permission it agreed to pay to that sovereign an export duty upon all its shipments at the rate of 3½ per cent.

After 1612 subscriptions were no longer taken from individuals in aid of the joint-stock capital, which was raised to 420,000l., and in 1617-18 a new fund of 1,600,000l. was subscribed. This last capital, although managed by the same directors, was kept wholly distinct from the former stock, and the profits resulting from it were separately accounted for to the subscribers.

The functions of government were first exercised by the company in 1624, when authority was given to it by the king to punish its servants abroad either by civil or by martial law, and this authority was unlimited in extent, embracing even the power of taking life. Under the peculiar circumstances of the case the granting of such a power might perhaps be necessary in order to prevent the grossest disorder in distant settlements, where no authority more regular was established; but this necessity proves only the impropriety on the part of the government of permitting the formation of settlements without at the same time making provision for the regular administration of justice.

The success which attended its commercial operations naturally induced a desire for their extension. In 1632 a third capital, amounting to 420,700l., was raised, and its management, although confided to the same directors, was also kept distinct from that of the first and second subscriptions.

There is some obscurity in the early annals of the company, which makes it uncertain whether the capitals here severally mentioned were considered as permanent investments or were returned to the subscribers at the termination of each different adventure.

A rival association, formed in 1636, succeeded in obtaining from the king, who accepted a share in the adventure, a license to trade with India, notwithstanding the remonstrances of the chartered body, of whose rights this was deemed an infringement. Promises indeed were given that the license should be withdrawn, but these promises were never fulfilled, and after carrying on their trade for several years in a spirit of rivalry which was fatal to their prosperity, the two bodies united in 1650, and thenceforward carried on their operations under the title of 'The United Joint Stock.' Two years after this arrangement was made the Company obtained from the Mogul, through the influence of a medical gentleman, Mr. Boughton, who had performed some cures at the Imperial Court, the grant of a license for carrying on an unlimited trade throughout the province of Bengal without payment of duties: for this privilege the very inadequate payment of 3000 rupees (375l.) was made by the Company.

Some proprietors of the Company's stock becoming dissatisfied with the management of the directors, obtained from Cromwell in 1655 permission to send trading vessels to India, and nominated a committee of management from their own body, for which they assumed the title of 'The Merchant Adventurers.' The evils to both parties of this rivalship soon became apparent, and in about two years from the commencement of their operations the Merchant Adventurers threw their separate funds into the general stock under the management of the directors. On this occasion a new subscription was raised to the amount of 786,000l. In April, 1661, a new charter was granted to the Company, in which all its former privileges were confirmed, and the further authority was given to make peace or war with or against any princes and people 'not being Christians;' and to seize all unlicensed persons (Europeans) who should be found within the limits to which its trade extended, and to send them to England.

The settlement at Madras, on the Coromandel coast, was made about 1648, to facilitate the investments in piece-goods, then a chief object in the trade with India; and in 1668 the Company obtained a further settlement on the western coast of the peninsula by the cession in its favour of the Island of Bombay, made by Charles II., into whose hands it had come as part of the marriage portion of the Princess Catherine of Portugal. Bombay had been in possession of the English government during only a very few years, and its cession to the Company was only made because the expense which it occasioned was far beyond the revenue which it could be made to produce to the crown. The grant declares that the island is 'to be held of the king in free and common soccage, as of the manor of East Greenwich, on the payment of the annual rent of 10l. in gold on the 30th of September in each year.' At the same time the Company was authorized to exercise all the powers necessary for the defence and government of the island.

The first occasion on which the Company was brought into hostile collision with any of the native powers of India occurred in the beginning of 1664, when Sevajee, the founder of the Maharatta States, found occasion, in the prosecution of his plans, to attack the city of Surat. On this occasion the native inhabitants fled; but the members of the British factory, aided by the crews of the ships in the harbour, made a successful resistance, and forced Sevajee to retire. To show his satisfaction at the conduct of the Europeans upon this occasion, the Mogul accompanied the expression of his thanks with an extension of the trading privileges enjoyed by the Company. Another attack made upon Surat by the Maharattas in 1670 was repelled with equal success.

The right given to the Company by the charter of 1661 of seizing unlicensed persons within the limits above mentioned, and sending them to England, was soon exercised in a manner which produced a very serious dispute, in 1666, between the two houses of parliament. A merchant, named Skinner, had gone in a ship loaded with merchandise to the Island of Barella, off the north-east coast of Sumatra, which he had bought from the king of Jambee, and upon which he had made a settlement. His ship and the island, with all the property thereon, were seized by the Company, upon which Mr. Skinner made complaint to the government, and by his importunities caused the matter to be referred first to a committeee of the privy council, and next to the House of Peers. It is difficult to understand the grounds for this last proceeding, or how the House of Peers could act judicially upon any case not brought before them by appeal from a court of law. Having awarded a compensation of 5000l. to Mr. Skinner for his losses, the affair was taken up by the House of Commons, who sent Mr. Skinner to the Tower, and passed a resolution declaring that any person who should proceed to execute the decision of the House of Lords was a betrayer of the rights and liberties of the Commons of England, and an infringer of the privileges of their house. These contentions proceeded to such a height, and were renewed so often, that the king adjourned the parliament in consequence seven times before he was able to induce the houses, by personal interference and persuasion used to influential members of both, to erase from their journals all their votes and resolutions relating to the subject. Mr. Skinner ultimately failed to procure any redress or compensation for his losses.

For several years following the junction with the Merchant Adventurers the trade of the Company was carried on uninterrupted by any serious rivalry, and with considerable success. Sir Josiah Child, who was one of the directors of the Company, in his Discourses on Trade, published in 1667, represents that trade as the most beneficial branch of English commerce, employing from 25 to 30 sail of the finest merchant ships in the kingdom, each manned with from 60 to 100 seamen,[*] and supplying us with saltpetre, pepper, indigo, calicoes, and drugs, besides materials for export to Turkey, France, Spain, Italy, and Guinea, without which a profitable trade with those countries could not be carried on. According to this representation, the trade of England must at that time have been insignificant indeed when compared with its amount in more modern times. In 1677-78 the whole adventure of the Company to India was 7 ships, with an investment of 352,000*l.* In 1678-79 the number of ships was 8, and the amount employed 393,950*l.* In 1679-80 there were despatched 10 ships with cargoes valued at 461,700*l.* In 1680-81, 11 ships, with the value of 596,000*l.*; and in 1681-82 there were 17 ships employed, and the investment amounted to 740,000*l.*

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[*] To show how imperfectly these matters were understood at that time, it may be mentioned that in a tract published in 1615, entitled 'The Trade's Increase,' and which was greatly esteemed, complaint is made of the decay of the English navigation, which is ascribed to the great consumption of mariners in the East India trade.

It was probably the indication of its profitableness afforded by the augmentation of the trade in the later years of the series just quoted, added to the great increase of commercial capital in the nation, that caused the formation of a project for establishing a rival company in 1682-83, but which failed to obtain the sanction of the government. As one means for discouraging similar attempts in future, the Company ceased to give any detailed statements concerning the amount of the trade, and for several years we have no knowledge as to the tonnage and amount of money to which it gave employment. Such an expedient was not likely to answer the end proposed. The veil of mystery thrown around their proceedings caused the public to entertain an exaggerated opinion concerning them, and tempted many private adventurers to set the regulations of the Company at defiance, and to despatch ships to trade where, according to the general belief, such great profits were to be obtained. These *interlopers*, as they were called, were seized by the Company's officers wherever they could be found, and under the pretext of piracy or some other crimes, they were taken before the Company's tribunals. Sentence of death was passed upon several, and the Company boasted much of the clemency that was shown in staying execution until the king's pleasure could be known; keeping the parties meanwhile in close confinement.

A new charter, to have effect for twenty-one years, was granted in 1693, in which it was stipulated that the joint-stock of the Company, then 756,000*l.*, should be raised to 1,500,000*l.*, and that every year the corporation should export British produce and manufactures to the value of 100,000*l.* at least. The power of the crown to grant the exclusive privileges given by this charter was questioned by the House of Commons, which passed a declaratory resolution to the effect 'that it is the right of all Englishmen to trade to the East Indies, or any part of the world, unless prohibited by act of parliament.' To obtain a charter thus at variance with the feelings of the people, it is known that bribery to a great extent was practised. The books of the Company, which were examined by order of the House of Commons, proved, indeed, that such practices were by no means new; that for many years bribes had been regularly given to men in power; and that in the year in which the charter was obtained nearly 90,000*l.* was distributed in this manner. The Duke of Leeds, who was charged with receiving 5000*l.*, was impeached by the Commons; and it is said that the prorogation of parliament which occurred immediately afterwards was caused by the tracing of the sum of 10,000*l.* to a much higher quarter.

As might be expected, the resolution of the House of Commons just recited, unnoticed as it was on the part of the crown, acted as an encouragement to new adventurers, many of whom, acting individually, began to trade with India; but a still more formidable rival arose in a powerful association of merchants, whose means enabled them to outbid the old Company for the favour of the government. The necessities of the crown being at that time great, the Company offered as the price of the confirmation of its charter the loan of 700,000*l.*, at 4 per cent. interest; but the associated merchants offering to lend 2,000,000*l.* at 8 per cent. interest, this offer was preferred, and an act was passed incorporating the association by the name of 'The General Society,' and authorizing the subscribers to trade with India, each one to the amount of his subscription, while such as desired to trade in combination might do so to the amount of their aggregate subscriptions. The old Company was allowed to trade for three years, and further to subscribe towards the stock of the General Society, of which latter privilege it availed itself to the amount of 315,000*l.* Those members of the General Society who preferred to trade upon a joint-stock soon after obtained another charter of incorporation, under the title of 'The English Company trading to the East Indies.' Their subscribed capital, which formed part of that of 'The General Society,' being all lent to the government, their trade was by no means greatly crippled, and did not equal in amount that carried on by the old Company, which body procured an act of parliament continuing its corporate rights, and entitling the members to trade on their own account in respect of the stock which they held in the General Society.

The commercial and political inconvenience that attended the working of these rival corporations was soon made apparent, and great efforts were made to bring about their union. The king himself strongly recommended such a course to both parties; but such was the spirit of hostility by which each was actuated, that whenever any advance towards accommodation was made by one, the other immediately drew back, and it was not until January, 1702, that the general terms of union were adjusted and mutually approved. The principal points embraced in this arrangement were, that of the court of twenty-four directors, twelve individuals should be chosen by the subscribers of each of the companies; that the directors should every year determine the amount of the exports, one half of which should be furnished by each company; that seven years should be allowed for winding up the separate concerns of each company, during which time each should appoint and employ separate factors in India; but that at the end of the seven years one great joint-stock should be formed by the complete union of the funds of both companies, which thenceforward were to be wholly subject to the absolute management of the same directors in England, and the same officers in India. An indenture, to which the queen was made a party, was drawn up to give efficacy to this arrangement: this indenture was passed under the great seal of the kingdom, and the two companies took the common name which has been continued to the present day, of 'The United Company of Merchants trading to the East Indies.'

That part of this arrangement which provided for the independent management of the affairs of each company in India during seven years was the occasion of many serious disagreements, which however gave place to a feeling of common danger. The necessities of the government induced it to call upon the Company for a loan of 1,200,000*l.* without interest, and it was impossible for it to raise the necessary funds unless their disputes were previously settled, while there was danger lest some other association might be formed which should take advantage of the wants of the government to obtain privileges at the expense of the existing corporation. Under this feeling, both parties agreed to refer their differences to the arbitration of Lord Godolphin, then lord high treasurer of England, whose award, dated in September, 1708, was made the foundation of the Act 6 Anne, chap. 17, which is the foundation of the privileges long enjoyed by the United East India Company. Under this act, the Company advanced the sum required (1,200,000*l.*) without interest, to government. This sum, added to the former loan of 2,000,000*l.* at 5*l.* per cent., made the debt of the government 3,200,000*l.*, and the interest equal to 5*l.* per cent. upon the whole sum. The charter, which under the old indenture might have been terminated in 1711, was continued until the expiration of a notice of three years, which could not be given earlier than March, 1726, and further until the money borrowed by the government should be repaid. The Company was empowered to add the 1,200,000*l.* to its capital, and to raise 1,5[illegible] either by bonds under its common seal or by contributions from its members.

Having thus briefly sketched the history of the various bodies which, after successive unions and arrangements, came, in 1708, to form the body which has since performed so important a part in the history of the world under the title of the United East India Company, it is necessary now to give some account of its constitution and government, and to trace that part of its history which has carried it from conquest to conquest, and made it in fact one of the greatest sovereign powers of the present times.

The capital stock of the Company, which, in [illegible] amounted to . . . . £ 3,2[illegible] was increased, under successive acts of parliament, as follows:—

In 1786 . .	8[illegible]
1789 . .	1,0[illegible]
1794 . .	1,0[illegible]
Making its present capital	**£ 6,0[illegible]**

upon which sum dividends are paid: the later subscriptions were made at rates considerably above par, so that the money actually paid into the Company's treasury on that account has been 7,780,000*l.*

The home government of the Company consists of—

1st. The Court of Proprietors;

2nd. The Court of Directors; and

3rd. The Board of Control, the origin and functions of which body will be hereafter explained.

The Court of Proprietors elect the directors of the Company, declare the amount of dividend, and make by-laws, which are binding upon the directors for the management of the Company in all respects which are not especially regulated by act of parliament. The votes of the proprietors are given according to the amount of stock which they possess. The lowest sum which entitles a proprietor to vote is 1000*l.* of stock; 3000*l.* stock entitles to two votes; 6000*l.* to three votes; and 10,000*l.* to four votes, which is the largest number of votes that can be given by any one proprietor. At the time of the last parliamentary inquiry into the concerns of the Company, it was stated that the number of proprietors entitled to vote was 1976: of this number 54 were entitled each to four votes; 50 had each three; 370 had two votes; and 1502 had single votes.

The Court of Directors consists of 24 proprietors elected out of the general body. The qualification for a seat in the direction is the possession of 2000*l.* stock. Six of the directors go out of office every year; they retire in rotation, so that the term of office for each is four years from the time of election. The directors who vacate their seats may be re-elected, and generally are so, after being out of office for one year. The chairman and deputy chairman are elected from among their own body by the directors, thirteen of whom must be present to form a court.

The power of the directors is great: they appoint the governor-general of India and the governors of the several presidencies; but as these appointments are all subject to the approval of the crown, they may be said to rest virtually with the government. The directors have the absolute and uncontrolled power of recalling any of these functionaries. All subordinate appointments are made by the directors, but as a matter of courtesy a certain proportion of this patronage is placed at the disposal of the President of the Board of Control.

The Board of Control was established by the act of parliament passed in August, 1784, and which is known as Mr. Pitt's India Bill. This board was originally composed of six privy councillors, nominated by the king; and besides these, the chancellor of the exchequer and the principal secretaries of state are, by virtue of their offices, members of the board. It is no longer necessary to select the members from among privy councillors. In practice the senior member, or president, ordinarily conducts the business, and on rare occasions only calls upon his colleagues for assistance. It is the duty of this board to superintend the territorial or political concerns of the Company; to inspect all letters passing to and from India between the directors and their servants or agents which have any connexion with territorial management or political relations; to alter or amend, or to keep back, the despatches prepared by the directors, and, in urgent cases, to transmit orders to the functionaries in India without the concurrence of the directors. In all cases where the proceedings of the directors have the concurrence of the Board of Control, the court of proprietors has no longer the right of interference. The salaries of the president and other officers of the Board, as well as the general expenses of the establishment, are defrayed by the East India Company. With the restriction here described, the president of the Board of Control has been correctly described as "a secretary of state for the affairs of India, governing by means of the court of directors as its instrument in all matters of a political nature," which, since the last renewal of the charter in 1833, includes all the functions of the company; the right of trading having by that act been taken away.

The act 6 *Anne*, c. 17, already mentioned, conferred upon the company the exclusive privilege, as regarded English subjects, of trading to all places eastward of the Cape of Good Hope to the Straits of Magellan; and these privileges, with some unimportant modifications, which it is not necessary to explain, were confirmed by successive acts of parliament, and continued until 1814. By the act 53 Geo. III., c. 155, passed in 1813, the Company's charter was renewed for twenty years, but received some important modifications, the trade to the whole of the Company's territories and to India generally being thrown open to British subjects under certain regulations; the trade between the United Kingdom and China was still reserved as a monopoly in the hands of the East India Company. It was also provided by the act of 1813 that the territorial and commercial accounts of the Company should be kept and arranged so as to exhibit the receipts and expenditure of each branch distinctly from those of the other branch. These accounts, made out in forms approved by government, the directors are obliged to lay before both houses of parliament in the month of May in every year, "made up according to the latest advices that shall have been received, and with as much accuracy as the nature of the case will admit." In imposing this obligation upon the directors, it would almost appear that the legislature must have had in view the course which, twenty years later, on the next occasion of renewing the charter, was actually pursued. The act of 1833, by which the charter was renewed for twenty years, takes away from the Company the right of trading either in its own territories or the dominions of any native power in India or in China, and throws the whole completely open to the enterprise of individual merchants. The progress of the Company's trade at different periods has not been regularly published. The investigations that have been made into its concerns by committees of the houses of parliament, when it has been necessary to renew its charter, have been the means of bringing to light some information upon this subject; but the returns called for on each of these occasions have generally had reference only to the period immediately preceding that in which the inquiry has been made. The committee of secrecy which sat in 1773 did indeed call for various statements embracing a considerable period of time; and it is from the report of this committee that the following particulars relating to the trade of the Company, in the forty years between 1732 and 1772, have been obtained. Dividing this term of forty years into decennary periods, the average result in each period was as follows:—

	Exports of goods and bullion	Bills of exchange paid	Total cost of goods imported	Amount of sales of goods
1733 to 1742	£617,283	£167,311	£784,594	£1,689,775
1743 .. 1752	880,953	196,159	1,083,696	2,035,382
1753 .. 1762	797,619	309,076	1,100,374	2,080,164
1763 .. 1772	667,690	324,422	991,022	2,296,763
Average of 40 years.				
1733 .. 1772	742,285	247,192	989,727	2,171,677

It would appear from this statement that the trade must have been highly advantageous. The average annual profit upon the amount invested, as above shown, amounted, in the first decennary period, to 116 per cent.; in the second period to 99 per cent.; in the third period to 84 per cent.; in the fourth period to 132 per cent.; and embracing the whole forty years, the gross profit amounted to 112½ per cent. It must be borne in mind, however, that this was *gross* profit, and that the expenses of carrying on the trade according to the method employed of establishing factories were necessarily very great. In fact, they were such as to absorb the profits and to bring the Company considerably into debt; a result which it would be more correct to attribute to the political character of the Company than to its necessary commercial expenditure.

When compared with the commercial dealings of even individual merchants in modern times, the trade of the East India Company, as exhibited above, is insignificant. Small as it was, however, it afterwards experienced a considerable diminution, and in 1780 the entire value of the exports of goods and bullion amounted to only 401,106*l.*, a large part of which must have consisted of military stores and supplies required by the various factories and establishments of the Company. The commutation plan of Mr. Pitt, under which the duty on tea was reduced to 12½ per cent. *ad valorem*, and which came into effect in September, 1784, caused a considerable augmentation of the Company's outward investments, in order to procure the quantity of tea needed for use in this kingdom. The sales of tea at the India House, which, in the three years preceding the commutation, averaged 5,721,655 lbs., rose in the three following years to the average of 15,534,602 lbs., at which quantity it remained nearly stationary for several years. Notwithstanding this circumstance, the value of the exports made by the Company in each of the three years which preceded the renewal of the charter in 1793 did not exceed one million. Under the provisions of this new charter, the Company was bound to provide 3000 tons of shipping every year for the accommodation of private traders, and it is deserving of remark that under this apparently unimportant degree of competition the trade of the Company increased rapidly and greatly. During the last four years of its existence, from 1810-11 to 1813-14, the average annual exports of the Company were—

	Goods.	Stores.	Total.
	£	£	£
To the three Presidencies, Batavia, Prince of Wales's Island, St. Helena, and Bencoolen	722,033	397,481	1,119,514
To China	1,023,065	2,786	1,025,851
Total	1,745,098	400,267	2,145,365

On the occasion of the next renewal of its charter, viz. in 1814, the Company was obliged to make a further cession of its exclusive privileges, and stipulating only for the continuance of its monopoly in the importation of tea into this country, to allow the unrestricted intercourse of British merchants with the whole of its Indian possessions. Under these circumstances the Company found it impossible to enter into competition with private traders, whose business was conducted with greater vigilance and economy than was possible on the part of a great company; its exports of merchandise to India fell off during the ten years from 600,000*l.* in 1814-15 to 275,000*l.* in 1823-24, and to 73,000*l.* in the following year, after which all such exportation of merchandise to India on the part of the Company may be said to have ceased. The shipments to China were still continued, and large quantities of stores were also sent to India for the supply of the army and other public establishments.

It will be seen from the following statement of the value of exports from this country from 1814 to 1832 to all places eastward of the Cape of Good Hope, except China, in which the shipments of the Company (which include stores) are distinguished from those of private traders, that while the trade of the Company was thus falling off, that of private merchants was carried to an amount much greater than had existed during the monopoly of the Company.

	By the East India Company.	By Private Traders.	Total Value of Exports.
1814	£826,558	£1,048,132	£1,874,690
1815	996,248	1,569,513	2,565,761
1816	633,546	1,955,909	2,589,455
1817	638,382	2,750,333	3,388,715
1818	553,385	3,018,779	3,572,164
1819	760,508	1,586,575	2,347,083
1820	971,096	2,066,815	3,037,911
1821	887,619	2,656,776	3,544,395
1822	606,089	2,838,354	3,444,443
1823	458,550	2,957,705	3,416,255
1824	654,783	2,841,795	3,496,578
1825	598,553	2,574,660	3,173,213
1826	990,964	2,480,588	3,471,552
1827	805,610	3,830,580	4,636,190
1828	488,601	3,979,072	4,467,673
1829	434,586	3,665,678	4,100,264
1830	195,394	3,891,917	4,087,811
1831	146,480	3,488,571	3,635,051
1832	149,193	3,601,093	3,750,286

The impossibility, as thus shown, of the Company's entering into competition with private merchants had a powerful influence with parliament when it was last called upon to legislate upon the affairs of India, and in the charter of 1833 not only was the monopoly of the China trade abolished, but the Company was restricted from carrying on any commercial operations whatever upon its own account, and was confined altogether to the territorial and political management of the vast empire which it has brought beneath its sway.

Having thus, as briefly as possible, traced the progress of the Company from its foundation to the close of its commercial existence, it remains to describe it in its far more important capacity as the possessor of an empire almost [illegible]l in extent, and containing a population of one [illegible]llions of subjects.

The commencement and early progress of the political power of the East India Company in India have already been described. [BENGAL.] It would extend this notice to an unreasonable length if we attempted to trace the successive wars and conquests which mark the annals of the Company; this, indeed, is the less needed because of the notices given in our account of the various provinces and states of India, in which that information necessarily finds a place. All that it appears requisite to give under this head will be found in the following chronological table of the acquisitions of the British in India, in which are stated the powers from whom the territory has, from time to time, been acquired.

Date.	Districts, &c.	Power from whom acquired.
1757	Twenty-four Pergunnahs	Nabob of Bengal
1759	Masulipatam, &c.	The Nizam
1760	Burdwan, Midnapore, and Chittagong	Nabob of Bengal
1765	Bengal, Bahar, &c.	The Mogul
,,	Company's Jaghire, near Madras	Nabob of Arcot
1766	Northern Circars	The Nizam
1775	Zamindary of Benares	Vizier of Oude
1776	Island of Salsette	The Maharattas
1778	Nagore	Rajah of Tanjore
,,	Guntoor Circar	The Nizam
1786	Pulo Penang	King of Queda
1792	Malabar, Dundigul, Salem, Barramahal, &c.	Sultan of Mysore
1799	Coimbatore, Canara, Wynaad, &c.	Ditto
,,	Tanjore	Rajah of Tanjore
1800	Districts acquired by the Nizam in 1792 and 1799 from Sultan of Mysore	The Nizam
1802	The Carnatic	Nabob of the Carnatic
,,	Gorruckpore, Lower Doab, Bareilly	Vizier of Oude
,,	Districts in Bundelcund	The Peishwa
1804	Cuttack and Balasore	Rajah of Berar
,,	Upper part of Doab, Delhi, &c.	Dowlut Rao Scindia
1805	Districts in Gujerat	The Guicowar
1815	Kumaon and part of the Terrele	Rajah of Nepal
1817	Saugur and Huttah Darwar, &c.	The Peishwa
,,	Ahmedabad Farm	The Guicowar
1818	Candeish	Holkar
,,	Ajmeer	Dowlut Rao Scindia
,,	Poonah, Concan, Southern Maharatta Country, &c.	The Peishwa
1820	Lands in Southern Concan	Rajah of Sahwuntwaree
1822	Districts in Bejapore and Ahmednuggur	The Nizam
1824	Singapore	Rajah of Johore
1825	Malacca	King of Holland
1826	Asam, Aracan, Tarri, &c.	King of Ava
,,	Districts on the Nerbudda, Patna, Sumbhulpore, &c.	Rajah of Berar

It has always been felt to be highly anomalous that an association of individuals, the subjects of a sovereign state, should wage wars, make conquests, and hold possession of territory in foreign countries, independent of the government to which they owe allegiance. At a very early period of the Company's territorial acquisitions, this feeling was acted upon by parliament. By the act 7 Geo. III., c. 57 (1767), it was provided, that the Company should be allowed to retain possession of the lands it had acquired in India for two years, in consideration of an annual payment to the country of 400,000*l.* This term was extended by the 9 Geo. III., c. 24, to February, 1774. The sums paid to the public under these acts amounted to 2,169,398*l.* The last of these payments, which should have been made in 1773, was not received until 1775, and could not then have been paid but for the receipt of 1,400,000*l.* which was lent to the Company by parliament. This loan was afterwards discharged, and the possession of its territory was from year to year continued to the Company until 1781, and was then further continued for a period to terminate upon three years' notice to be given after 1st March, 1791. Under this act the Company paid to the public 400,000*l.* in satisfaction of all claims then due. In 1793 the same privileges were extended until 1814, the Company engaging to pay to the public the sum of 500,000*l.* annually, *unless prevented by war expenditure;* but owing to the contests in which it was engaged throughout that period, two payments of 250,000*l.* each, made in 1793 and 1794, were all that the public received under this agreement.

The act of 1813, by which the charter was renewed for twenty years from 1814, continued the Company in possession of its territory, without stipulating for any immediate payment to the public; it provided that the accounts of the Company, both in England and in India, should be so kept as to exhibit the territorial and political, distinct from the commercial, branch of its concerns, the territorial revenue being appropriated strictly to the expenses of government and the repayment of the territorial debt, while the commercial receipts and profits were alone applicable to commercial objects, and to the payment of dividends to the proprietors. The 59th section of the act provided that when the territorial debt should be reduced to 13,000,000[illegible] the territorial profits should be applied first to the repayment of any public funds that might have been created in this country for the use of the Company, and that they should be then paid into the public exchequer to accumulate until the deposits should amount to 12,000,000*l.*, which sum should be reserved for securing the capital stock of the Company, and providing an annuity to the proprietors equal to the rate of dividend, 10½ per cent. per annum, which they then received. In the event of the accumulations going beyond 12,000,000*l.*, one-sixth only of the surplus was to go to the Company, and five-sixths to be the property of the public. By these provisions the right of parliament to assume possession of the Company's territories and of the revenues derived from them is clearly established.

Throughout the whole of the territories held in absolute sovereignty by the East India Company, it exercises the right of ownership in the soil, not by retaining actual possession in its own hands, but by levying assessments, which have usually been so calculated as to yield the greatest amount of present rental that could be collected from the cultivators, very frequently 'all that could be raised without diminishing the number of the inhabitants or desolating the country.' Before the sway of the English in India, the lands were held by a class of men who cultivated the soil with their own hands, whose right of perpetual occupancy was never questioned, but who were subject to the demands of their several governments, demands unlimited as to the right of the sovereign, but limited in fact by custom, which was stronger than the sovereign power. Different systems, as regarded the mode of collecting the rent on the part of the government, existed in different parts of the country. In some places the rent, or rather the amount of the tax, was collected in one sum from each village, which kept up an establishment of officers, whose functions consisted in first apportioning according to the means of each, and in then levying the sum assessed among the cultivators. In other cases government officers were appointed who received charge of several districts, and who were paid for their services by a per-centage upon the amount collected. These officers were known as Talookdars, or more commonly as Zemindars, and this system has from them acquired its name of the Zemindary system. It was usual formerly for the government to allow to the zemindar one-tenth of the amount of the collections, and to require the remaining nine-tenths to be paid into its treasury. In 1793, however, the Marquess Cornwallis, being then Governor General of India, formed the resolution of fixing the assessment, and placing the zemindars in the situation of proprietors, engaging not to raise at any time the amount of the assessments against them. This arrangement, known as the *permanent settlement*, has been established through a great part of the presidencies of Bengal and Madras, including the eastern polygars in the south, and hill zemindars in the Northern Circars.

It was hoped that by this means the zemindars would have been induced to improve their estates, since the whole increased revenue resulting from such improvements would have been permanently theirs. Unfortunately the power thus confided to the landholder has been used principally as the means of oppressing the actual cultivators, the ryots, and in order to repair this evil the Company has of late years become the purchaser of all estates thus held which have been brought to sale, and making its bargain direct with the ryots, the actual cultivators of the soil, with the view of abolishing the system of employing middle-men: this plan is known under the name of *the ryotwary system*.

The executive government of the Company's territories is administered at each of the presidencies by a governor and three councillors. The governor of Bengal is also the governor general of India, and has a control over the governors of the other presidencies, and if he sees fit to proceed to either of those presidencies, he there assumes the chief authority. The governors and their councils have each in their district the power of making and enforcing laws, subject in some cases to the concurrence of the supreme court of judicature, and in all cases to the approval of the court of directors and the board of control. Two concurrent systems of judicature exist in India, viz.: the Company's courts and the king's or supreme courts. In the Company's courts there is a mixture of European and native judges. The jurisdiction of the king's courts extends over Europeans generally throughout India, and affects the native inhabitants only in and within a certain distance around the several presidencies: it is in these courts alone that trial by jury is established. Every regulation made by the local governments affecting the rights of individuals must be registered by the king's court in order to give it validity.

The constitution, in other respects, of the East India Company is shown by the following brief analysis of the principal clauses of the act 3 and 4 William IV., c. 85, which received the royal assent, 28th August, 1833, and under which its concerns are at present administered:—

Sec. 1.—The government of the British territories in India is continued in the hands of the Company until April, 1854. The real and personal property of the Company to be held in trust for the crown, for the service of India.

2.—The privileges and powers granted in 1813, and all other enactments concerning the Company not repugnant to this new act, are to continue in force until April, 1854.

3.—From 22nd April, 1834, the China and tea trade of the Company to cease.

4.—The Company to close its commercial concerns, and to sell all its property not required for purposes of government.

9.—The debts and liabilities of the Company are charged on the revenues of India.

43.—The governor general in council is empowered to legislate for India and for all persons, whether British or native, foreigners or others.

44.—If the laws thus made by the governor-general are disallowed by the authorities in England, they shall be annulled by the governor-general.

81.—Any natural-born subject of England may proceed by sea to any port or place within the limits of the Company's charter having a custom-house establishment, and may reside thereat, or pass through to other parts of the Company's territories to reside thereat.

86.—Lands within the Company's territories may be purchased and held by any persons where they are resident.

87.—No native nor any natural-born subject of his majesty resident in India, shall, by reason of his religion, place of birth, descent, or colour, be disabled from holding any office or employment under the government of the Company.

88. Slavery to be immediately mitigated, and abolished as soon as possible.

The alterations in the constitution and administration of the Company effected by this act of 1833 are calculated to exercise a very important influence upon the future condition of the inhabitants of India. So long as the Company was allowed to combine commercial pursuits with its political character, its power might always have been, and very frequently was exercised in a manner ruinous to private traders. The extensive scale upon which its purchases were made raised prices in the country of production, and tended to lower them in Europe, and as it was never known in what articles the investments of the Company were to be made, their competitors were always forced to act under apprehension of interference, that set all their calculations at defiance. Now that the trade has been allowed to take a more natural course, we may confidently expect that the usual good result will attend upon the employment of individual skill and enterprise, that greater regularity of prices will be experienced, and that production will be stimulated until the prices of India produce are brought within the compass of a larger number of European consumers than at present. The advantages in England of this state of things must be great. To use the emphatic words of Dr. Wallich, the superintendent of the Company's botanic garden at Calcutta, "The Company's territories in India are productive of every article which can conduce to the happiness of man; and it only requires skill and ingenuity, and encouragement, both to the natives and to Europeans in India, to select every thing that can possibly be desired.' On the other hand, the luxuries and conveniences of European production, which are suited to the tastes of the natives of India, are equally varied and numerous, and present experience warrants the belief that under a regular course of trade, the circle of our customers for these productions will be continually enlarged. The progress here described must be greatly accelerated by the provisions contained in the 81st and 86th sections of the act, which authorise the settlement of Europeans in India and the purchase of lands by them. Previously to the passing of this act, the Company possessed the right of arbitrary deportation against Europeans without trial or reason assigned, and British-born subjects were not only restricted from purchasing lands, but were prohibited from even renting them. Under the 87th section, if fairly carried into execution, a greater inducement than had hitherto been offered, is held out to the natives of India to qualify themselves for advancement in the social scale; a circumstance from which the best moral effects upon their characters are expected to result.

The revenue of the Indian government is not confined to its collections from the land, but consists likewise of customs—duties, stamp-duties, subsidies, and tribute from certain native states, some local taxes, and the profits arising from the monopolies of salt and opium. The following is an abstract of the revenues and charges of the Indian government during each of the three years 1831-32 to 1833-34, the latest for which the accounts have yet been presented to parliament.

	1831-32.	1832-33.	1833-34.
REVENUES.	£	£	£
Bengal	9,474,084	9,487,778	8,844,241
Madras	3,322,155	2,969,956	3,235,233
Bombay	1,401,916	1,497,308	1,600,691
Total revenues of India	14,198,155	13,955,042	13,680,165
CHARGES.			
Bengal	7,535,170	7,687,228	7,018,449
Madras	3,239,261	3,174,347	3,258,935
Bombay	2,060,498	2,034,710	1,968,045
Charges on account of St. Helena	94,152	95,553	91,641
Charges disbursed in England	1,476,655	1,227,536	1,293,637
Total charges of India	14,405,736	14,219,374	13,630,767
Deficiency	207,581	264,332	—
Surplus	—	—	49,398

	Debts.	Annual Amount of Interest.
Public debts bearing Interest.	£	£
Bengal	31,508,574	1,609,844
Madras	3,351,271	112,857
Bombay	603,638	31,844
	35,463,483	1,754,545

The great extent of its territories, and the nature of the tenure by which they are held, oblige the Company to keep on foot a large standing army, which is necessarily accompanied by great expense. The most recent detailed account that has been given upon this subject has reference to the year 1830, in which year the total number of the military force employed at the three presidencies and subordinate settlements in India amounted to 224,444 men, and its expense to 9,474,481*l*. The different descriptions of force and the expense attending each were then as follows:—

	Total.	Expense.
Engineers—Officers, European and Natives, and Rank and File	1084	£83,873
Artillery—European—Horse	2560	199,141
Foot	7469	252,343
Native—Horse	1062	74,239
Foot	6294	100,740
Cavalry—European—King's	2577	172,588
Native—Company's—Regular	12,248	718,853
Irregular	4714	179,393
Infantry—European—King's	17,731	628,612
Company's	3634	122,400
Native—Regular	124,391	3,103,355
Irregular	24,306	270,712
Invalids	10,588	
Pioneers	3487	74,511
Hospital	1266	
Expense of Medical Department		132,858
Staff	1033	488,490
Commissariat		614,327
Other Military charges		2,258,046
Total Force	224,444	
Total Expense		£9,474,481

The distribution of this force on the 30th of April, 1830 was as follows:—

	Bengal.	Madras.	Bombay	Prince of Wales's Island.	St. Helena.	Total.
Engineers	869	30	185	..	..	[illegible]
Artillery.—European	4,403	2,779	2,425	..	423	[illegible]
Native	3,539	2,773	1,044	..	..	[illegible]
Cavalry.—European	1,235	637	765	..	..	[illegible]
Native	9,211	4,934	2,817	..	..	[illegible]
Infantry.—European	8,350	[illegible]	4,404	..	445	[illegible]
Native	80,482	42,968	25,347	..	..	[illegible]
Invalids	2,746	[illegible]	1,863	..	92	[illegible]
Pioneers	851	1,719	918	..	..	[illegible]
Hospital	457	494	292	15	8	[illegible]
Staff	440	445	148	..	..	[illegible]
	112,583	70,730	40,148	15	968	[illegible]

EAST INDIES. The portion of the globe to which the name of India, or the East Indies, is given, is usually understood to comprehend the peninsula of Hindostan lying to the east of the river Indus, and thence eastward as far as the boundary of the Chinese empire, by which empire, and by Tartary, India is also bounded on the north. The East Indies include also the islands of the Indian Ocean which lie between Hindostan and Australia as far north as the Philippine Islands, and as far east as Papua, but without including either the Philippines or Papua.

EASTER, Anglo-Saxon *Eastre*, a moveable feast, held in commemoration of the Resurrection; being the most important and most antient in observance, it governs the whole of the other moveable feasts throughout the year. In the Greek and Latin churches it is called *Πασχα*, *Pascha*, originally derived from a Hebrew word signifying a passage, which was the name given to the great feast of the Passover, held by the Jews on the same day with that on which our Saviour held his paschal feast. The etymologies of the word Easter have been various. Bede says, it was derived from a goddess called *Eostre*, to whom the people used at this season to celebrate festivals; but the most obvious is the Anglo-Saxon *yst*, a storm, the time of Easter being subject to the continual recurrence of tempestuous weather.

That the observation of Easter is as antient as the time of the Apostles seems undoubted. In the second century, however, a controversy arose as to the exact time of its celebration. The Eastern churches kept it on the 14th day of the first Jewish month; the Western churches on the night which preceded the anniversary of our Saviour's resurrection. The inconvenience of the former was, that the festival was commonly held upon other days of the week than the first, or Sunday, which was undoubtedly the proper day. The disputants retained their respective customs till towards the middle of the fourth century, when the rule for the celebration of Easter was fixed by the Council of Nice, A.D. 325. It was ordered to be held on the Sunday which falls next after the first full moon following the 21st of March, or vernal equinox.

Brand, in his Popular Antiquities, has given a long enumeration of the sports and observances at Easter in former times, including a few superstitions. The mutual presentation of coloured eggs at this season from friends continues both in the East and in Russia. (See Dr. E. D. Clarke's *Travels*, vol. i., 4to., Cambr., 1810, p. 59.) *Lifting*, originally designed to represent our Saviour's resurrection, is also still practised on Easter Monday and Tuesday in England, in Lancashire and some other counties; on which days, as well as at Whitsuntide, the Londoners repair for the celebration of their popular gaieties at Greenwich fair. Tansey puddings and cakes were antiently eaten in England at Easter.

(Broughton's *Dict. of all Religions*, fol., London, 17[illegible] p. 395; Brady's *Clavis Calendaria*, 8vo. London, 1[illegible] vol. i., p. 269; Brand's *Popular Antiquities*, vol. i. [illegible] 137-155.)

EASTER, Method of Finding. The importance of this question, in aiding historical reference, is confined to the definition of Easter Sunday which was finally adopted by the western church. It is as follows: the Sunday following the full moon which follows the 21st of March; if the full moon fall *on* the 21st of March, therefore, the [illegible] full moon is the paschal moon; and if the paschal moon fall *on* a Sunday, the next Sunday is Easter Sunday.

By common consent, it is not the real sun or the [illegible] moon which is employed in finding Easter, but the fictitious sun and moon of astronomers, which move uniformly with the average motion of the real bodies. It must therefore never surprise any one to find the Easter of any year not agreeing with the above definition, since such a case might (and sometimes must) arise. Say, for instance, that the real opposition of the sun and moon took place at a minute before twelve o'clock at night, March 21, and that of the average sun and moon two minutes after the above. The consequence would be that, reckoning by the real bodies the full moon in question would not be the paschal full moon, while that of the average bodies would be so. But the following rules will determine the Easter day of chronologists in any year of the Christian era, which is all that is required:—

First, ascertain the dominical letter, taking the second where there are two. [DOMINICAL LETTER.] Next, ascertain the golden number (year of the Metonic cycle) as follows: add one to the date of the year and divide by 19, the remainder (or if there be no remainder, 19 itself) is the golden number. The following table must then be used, in the manner to be immediately explained:—

	O.S.	N.S.		O.S.	N.S.
March 21 C	16	14	April 9 A	17	15
22 D	5	3	10 B	6	4
23 E	—	—	11 C	—	—
24 F	13	11	12 D	14	12
25 G	2	—	13 E	3	1
26 A	—	19	14 F	—	—
27 B	10	8	15 G	11	9
28 C	—	—	16 A	—	—
29 D	18	16	17 B	19	17
30 E	7	5	18 C	8	6
31 F	—	—	19 D	—	—
April 1 G	15	13	20 E	—	—
2 A	4	2	21 F	—	—
3 B	—	—	22 G	—	—
4 C	12	10	23 A	—	—
5 D	1	—	24 B	—	—
6 E	—	18	25 C	—	—
7 F	9	7			
8 G	—	—			

O. S. means *old style*; N. S., *new style*.

Having the golden number, and the dominical letter, find out the golden number in the second or third column, according as old style or new style is meant; and look down the first column until the *next* occurrence of the dominical letter comes. Easter day is opposite. Thus the golden number being 13 and the dominical letter F, Easter day is March 31 in the old style, April 7 in the new style.

Example 1.—What was Easter day A.D. 1612 (old style)?

The dominical *letters are* A G. Take the second, G.

1612
1
19)1613(84
rem. 17 the golden number.

Opposite to 17, under O.S., comes April 9 A, and the next G which occurs is opposite to April 15, which was therefore Easter day.

Example 2.—When will Easter-day fall, A.D. 1841?

The dominical letter is C.

1841
1
19)1842(96
rem. 18 the golden number.

Opposite to 18, under N.S., is April 6 E, and the next C is opposite to April 11, which is therefore Easter day.

The following table gives Easter day for every year from 1800 to 1999. Thus in 1873 Easter day is April 13 (a. 13); in 1878 it is April 21 (a. 21).

	18.	19.		18.	19.		18.	19.
00	a. 13	a. 15	34	m. 30	a. 1	67	a. 21	m. 26
01	a. 5	a. 7	35	a. 19	a. 21	68	a. 12	a. 14
02	a. 18	m. 30	36	a. 3	a. 12	69	m. 28	a. 6
03	a. 10	a. 12	37	m. 26	m. 28	70	a. 17	m. 29
04	a. 1	a. 3	38	a. 15	a. 17	71	a. 9	a. 11
05	a. 14	a. 23	39	m. 31	a. 9	72	m. 31	a. 2
06	a. 6	a. 15	40	a. 19	m. 24	73	a. 13	a. 22
07	m. 29	m. 31	41	a. 11	a. 13	74	a. 5	a. 14
08	a. 17	a. 19	42	m. 27	a. 5	75	m. 28	m. 30
09	a. 2	a. 11	43	a. 16	a. 25	76	a. 16	a. 18
10	a. 22	m. 27	44	a. 7	a. 9	77	a. 1	a. 10
11	a. 14	a. 16	45	m. 23	a. 1	78	a. 21	m. 26
12	m. 29	a. 7	46	a. 12	a. 21	79	a. 13	a. 15
13	a. 18	m. 23	47	a. 4	a. 6	80	m. 28	a. 6
14	a. 10	a. 12	48	a. 23	m. 28	81	a. 17	a. 19
15	m. 26	a. 4	49	a. 8	a. 17	82	a. 9	a. 11
16	a. 14	a. 23	50	m. 31	a. 9	83	m. 25	a. 3
17	a. 6	a. 8	51	a. 20	m. 25	84	a. 13	a. 22
18	m. 22	m. 31	52	a. 11	a. 13	85	a. 5	a. 7
19	a. 11	a. 20	53	m. 27	a. 5	86	a. 25	m. 30
20	a. 2	a. 4	54	a. 16	a. 18	87	a. 10	a. 19
21	a. 22	m. 27	55	a. 8	a. 10	88	a. 1	a. 3
22	a. 7	a. 16	56	m. 23	a. 1	89	a. 21	m. 26
23	m. 30	a. 1	57	a. 12	a. 21	90	a. 6	a. 15
24	a. 18	a. 20	58	a. 4	a. 6	91	m. 29	m. 31
25	a. 3	a. 12	59	a. 24	m. 29	92	a. 17	a. 19
26	m. 26	a. 4	60	a. 8	a. 17	93	a. 2	a. 11
27	a. 15	a. 17	61	m. 31	a. 2	94	m. 25	a. 3
28	a. 6	a. 8	62	a. 20	a. 22	95	a. 14	a. 16
29	a. 19	m. 31	63	a. 5	a. 14	96	a. 5	a. 7
30	a. 11	a. 20	64	m. 27	m. 29	97	a. 18	m. 30
31	a. 3	a. 5	65	a. 16	a. 18	98	a. 10	a. 12
32	a. 22	m. 27	66	a. 1	a. 10	99	a. 2	a. 4
33	a. 7	a. 16						

EASTER ISLAND, an island in the eastern part of the Pacific Ocean, more than 2000 miles distant from the coast of South America, is situated between 27° 5′ and 27° 12′ S. lat., and between 109° and 110° W. long. It is about thirty or forty miles in circuit, with a stony and hilly surface, and an iron-bound shore. The hills appear to rise to the height of 1200 feet, according to Beechey. At the south-eastern extremity of the island is an extinct volcano. Lava seems to form the principal component of the hills, which rise gradually and are covered with grass. The island has no safe anchorage, no wood for fuel, no fresh water, and no domestic animals, except a few fowls. The inhabitants live on yams, potatoes, and sugar-cane. In physiognomy, language, and manners, they resemble the inhabitants of the other groups of islands lying farther west. But it is remarkable, that on this island are found a number of colossal statues, some of which are fifteen or even eighteen feet high; they stand on platforms, which have been made with a considerable degree of art. Some conjecture that these monuments have been erected by a nation more numerous than its present inhabitants. Cook estimated the population at 600 or 700; but La Perouse thought that it amounted to 2000, and Beechey to 1260. (Cook, La Perouse, and Beechey.)

EAVES. [HOUSE.]

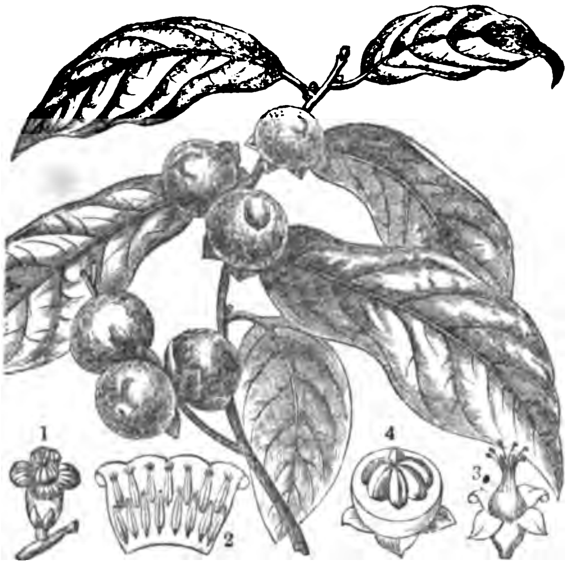
EBB. [TIDES.]

EBEL, JOHN GOTTFRIED, an esteemed writer on statistics and geology, born at Frankfort on the Oder, October 6, 1764; died at Zürich, 1830. After completing his studies and taking his degree as doctor of medicine, he went to France, and became intimately acquainted with the Abbé Sieyes. In 1801 he went to Switzerland, and resided chiefly at Zürich. He travelled through Switzerland in all directions, and published some very valuable works on the natural history and statistics of the country. The most popular is his 'Guide to Travellers in Switzerland.' In his description of the mountaineers of Switzerland, he draws an interesting picture of the inhabitants of Appenzel and Glarus. His work on the geology of the Alps touches also on the structure of the globe in general, and contains valuable information on the geognostical relations of the Alps.

EBELING, CHRISTOPHER DANIEL, born 1741, at Garmissen in Hildesheim; died in 1817. He studied theology at Göttingen, and acquired great knowledge of the oriental languages, especially the Arabic, and was thoroughly acquainted not only with the classical literature of Greece and Rome, but also with that of modern Europe, particularly England. He published numerous translations, &c., but his chief work is his 'Geography and History of the United States of North America,' 7 vols. 8vo., which was justly considered as a master-piece, not only in Europe, but still more in America itself. He was chosen a member of almost all the learned societies of the country, and the Congress voted him public thanks for his services. That part of his library which related to America, consisting of 3200 volumes, was purchased after his death by M. Israel

Thorndike, a friend of learning, at Boston, and presented to Harvard college. Ebeling was for thirty years professor of history and of the Greek language in the gymnasium at Hamburg. His industry was extraordinary. Besides the duties of his professorship and the composition of his chief work, he was for above twenty years keeper of the public library of the city, into which he introduced order and judicious arrangement, and composed a catalogue, which was much wanted. He besides contributed largely to numerous periodicals. He was of a most friendly, cheerful, and social disposition; and we must admire the wonderful patience and equanimity with which he bore for thirty years a hardness of hearing, which gradually increased to almost total deafness, so that a loud voice was scarcely perceptible to him even with the aid of an ear-trumpet.

EBENA'CEÆ, a natural order of monopetalous exogens with the following essential character:—Flowers either with separate sexes, or occasionally hermaphrodite. Calyx permanent, with from three to six divisions. Corolla monopetalous, regular, of a thick leathery texture, usually downy on the outside, with the same number of divisions as the calyx. Stamens twice or four times as numerous as the lobes of the corolla, adhering to its tube, and usually in two rows; sometimes adhering in pairs. Styles several. Fruit fleshy, superior, with only one pendulous seed in each cell. Embryo lying in much albumen, with large leafy cotyledons and a long taper radicle. The species consist entirely of bushes or trees, some of which are of large size; their leaves are alternate, with no stipules, and generally leathery and shining. Diospyrus Ebenus, and some others, yield the valuable timber called ebony. The fruit of Diospyrus Kaki is about as large as an apricot, and is dried as a sweetmeat by the Chinese. Most of the plants of this order are tropical; of the few found beyond the tropics, Diospyrus Lotus inhabits Africa and Switzerland, and D. Virginiana, the United States.



A branch of Diospyrus Lotus in fruit; 1, a flower; 2, a corolla, cut open: 3, the calyx and ovary; 4, a section of a ripe fruit, showing the seeds.

EBERSBACH, the largest village in the kingdom of Saxony, is situated in the eastern part of that kingdom, and in the circle of the Land, a subdivision of the province of Lusatia, in 51° 0′ N. lat., and 14° 38′ E. long. It is the centre of the linen manufacture of Saxony, is divided into Upper and Lower Ebersbach, has two churches, three schools, and about 700 houses, with upwards of 5000 inhabitants. There are more than 2000 looms in activity. It lies about nine miles north-west of Zittau.

EBIONITES, a sect of Christian Jews, which existed in Palestine and other parts of the East in the first and second centuries of our æra. Like the Nazarenes, with whom they have been often confounded, they continued to observe the precepts and ceremonies of the Mosaic law; they kept both the Sabbath and the Sunday, made their ablutions, used unleavened bread in the celebration of the eucharist, and moreover, abstained from eating flesh. Still they do not seem to have formed a distinct sect till after the second destruction of Jerusalem by Hadrian, when they became separated from the rest of the church by their dogmas as well as by their external practices. Origen, Epiphanius, Eusebius, and other early fathers, distinguish two sorts of Ebionites, namely, those who denied the divinity of Jesus Christ, asserting that he was the son of Joseph and Mary, though endowed with a prophetic gift, and those who maintained that he was born of a virgin, but denied his pre-existence as God. The Ebionites in general acknowledged only one gospel, namely, the Hebrew one, which goes by the name of St. Matthew, and that one mutilated. They discarded the Acts of the Apostles, and especially the Epistles of St. Paul, whom they considered as an apostate from the old law. They had several apocryphal books; among others, a life of St. Peter. The earlier Ebionites lived a regular life, and many of them observed celibacy, which they held in great esteem. The later Ebionites became much more lax in their morals. The name of Ebionites is said by Eusebius, Origen, and Irenæus to be derived from a Hebrew word of contempt, meaning 'poor low people,' which the Jews applied to those of their countrymen who had embraced Christianity. Others have derived it from a philosopher of the name of Ebion, whose existence however is doubtful. Epiphanius speaks at length of the Ebionites, but he confounds them with other sects, and his account cannot be trusted. (Mosheim, *Institutes of Eccles. History*, with *notes* by Dr. Murdoch; Neander, *Kirchengeschichte*.)

EBOE, is the name given in the West Indies to the blacks imported from the coasts of the Bight of Benin, as distinct from the natives of the Gold Coast and other parts of Africa. 'In their complexion they are much yellower than the Gold Coast and Whidah Negroes; but it is a sickly hue, and their eyes appear as if suffused with bile even while in perfect health. The conformation of the face in a great majority of them very much resembles that of the baboon.' (Edwards' *History of the West Indies*.) The Eboes are subject to great despondency and depression of spirits, which form a striking contrast to the frank and fearless temper of the Koromantyns, or Gold Coast Negroes. When the slave trade was still in vigour, the distinction between these two races was much attended to by the planters, who treated the Eboes with greater indulgence, in order to prevent their committing suicide, to which they were very prone. The Eboes practised circumcision and worshipped the guana. They were said to be cannibals in their native country.

EBONY is well known as a hard black-coloured wood, brought from the hot parts of the world. The Greek name is ébenos (ἔβενος), from which the Latin ébenus, and our word ebony have been immediately derived. It is first mentioned by Ezekiel, xxvii. 15, but in the plural, hobnem, where the men of Dedan are described as bringing to Tyre horns of ivory and ebony. The Persian name, abnoos, is that by which it is commonly known all over India: it is probable, therefore, that the name, like the wood itself, had an Eastern origin. From its hardness, durability, susceptibility of a fine polish, and colour, which has almost become another name for blackness, ebony has always been in high estimation, and in the present day is much used for mosaic work and ornamental inlayings, though cheaper woods dyed black are frequently substituted.

Herodotus (iii. 97) mentions ebony as part of the presents brought in considerable quantities to the king of Persia by the people of Ethiopia. Dioscorides describes two kinds, the Ethiopian, which was considered the best, and the other Indian, which was intermixed with whitish stripes and spots, and hence commentators have disputed whether there were one or two kinds of ebony. But the fact is, that several trees yield this kind of wood, and all belong to the genus Diospyros. Owing to the known geographical distribution of this genus, the antients must have derived their ebony either from the peninsula of India and the island of Ceylon or by the coasting trade from Madagascar; for no species of Diospyros has yet been discovered by botanists in the upper parts of Egypt or in Abyssinia, though it is not improbable that some may be found, as the climate is well suited to their existence.

The genus Diospyros (from dios and puros, which may be translated celestial food) has been so named from some of its species affording edible fruit. They all form large trees, with alternate, thick, often coriaceous leaves. The flowers are usually single and axillary, the male and female flowers separate or united. Calyx and corolla four-cleft, rarely five-cleft. Stamina often eight, but varying in different species. Germ superior, often eight-celled; cells one-seeded;

albuminous embryo. Styles three or four, rarely five, or one and variously divided. Berry from one to twelve-seeded, often eight-seeded. Embryo inverse, and furnished with albumen. Male flower frequently with twin anthers. The species are found chiefly in the tropical parts both of Asia and America, as in the Malayan archipelago and peninsula, and in almost every part of India. One species extends southwards to New Holland; one, D. Lotus, to Switzerland, and D. Virginiana into the United States of America. As some are remarkable for the wood which they afford, and others on account of their fruit, it is necessary only to notice a few of each, though the whole require the labours of a monographist.

Diospyros Ebenus, the true ebony, and that which is considered to be of the best quality, is a large tree, a native of the Mauritius, Ceylon, and apparently also of Madagascar, for D. laurifolia, Poir., collected by Commerson in that island, is considered the same. The leaves are very smooth, short, petioled, alternate, bifarious, oblong in shape, the buds very hairy; male flowers sub-corymbed, with about twenty anthers, the hermaphrodite solitary, octandrous. Large quantities of the ebony of this species have been sometimes imported into Europe.

D. Ebenaster. This is also a tree of considerable magnitude, a native of Ceylon, of which the leaves are coriaceous and smooth on both sides, and the buds smooth.

D. reticulata (Tessonaria, Poir.) is another elevated tree, a native of the Mauritius, of which the heart-wood forms ebony.

D. melanoxylon, described and figured by Rumph, iii., p. 4, Corom. Plants, 1 to 46, by Dr. Roxburgh, is the ebony tree of the Coromandel coast. It is found on the mountains of that coast as well as of Malabar, and in Ceylon. It grows to be very large, particularly the male tree, of which the wood is also most esteemed. The leaves, which are sub-opposite, oval, oblong, obtuse and villous, are deciduous in the cold season, the new ones appearing with the flowers in April and May; as in other species, it is only the centre of large trees that is black and valuable, and this varies in quantity according to the age of the tree. The outside wood, which is white and soft, time and insects soon destroy, leaving the black untouched. The ripe fruit is eaten by the natives, though rather astringent, as is also the bark. D. tomentosa and Roylei are other Indian species which yield ebony.

Several species of the genus bear fruit, which, though clammy and sub-astringent, is eaten by the natives of the countries where the trees are indigenous. We need name only the most celebrated, as D. Lotus, a native of Africa, but now common in the south of Europe, which bears a small yellow sweetish fruit about the size of a cherry, and which has by some been supposed to be the famous Lotus of the Lotophagi; but this is more likely to have been the jujube, called by botanists Zizyphus Lotus.

Diospyros Kaki is celebrated in China and Japan: specimens introduced into the Botanic Garden of Calcutta were found to be identical with others from Nepal. The fruit is described by Dr. Roxburgh as being tolerably pleasant. It is cultivated in China, where it attains the size of an orange, and is frequently sent to Europe in a dried state, and called the date-plum of China, and also keg-fig of Japan.

D. discolor of the Philippine Islands also bears a fruit which is esteemed, and called Mabolo.

D. Virginiana, the Persimmon tree, is indigenous in North America, especially in the middle and southern of the United States, where it attains a height of sixty feet, but it does not flourish beyond the 42° of N. latitude. The fruit while green is excessively astringent, but when ripe and especially after it has been touched by the frost, it is sweet and palatable. The fleshy part separated from the seeds is made into cakes, which are dried and preserved. A kind of cider has also been made from this fruit, and a spirituous liquor distilled from its fermented infusion.

D. glutinosa also affords a fruit which, though edible, is far from palatable, but more valuable as an article of commerce. The tree is middle sized, a native of the moist valleys amongst the mountains of the Circars, and all along the foot of the Himalaya to 30° N. latitude. Sir William Jones first mentioned what is well known throughout Bengal, that the astringent viscid mucus of the fruit is used for paying the bottoms of boats. The unripe fruit contains a large proportion of tannin, and its infusion is employed to steep fishing-nets in to make them more durable.

EBRO, IBERUS, a river of Spain which rises near Reynosa in Old Castile, at the foot of the Asturian mountains. Runs in an east-south-east direction, and crosses the north part of Old Castile. Afterwards, on reaching the frontiers of Biscay, it inclines more to the south-east, and marks the boundary between Biscay and Navarre on its left and Castile on its right bank, passes by Miranda and Logroño, then enters Navarre and divides the districts of Tudela and Cascante from the rest of that province. It then enters Aragon, which it divides into two nearly equal parts, one to the north-east and the other to the south-west of its course, flows by Zaragoza and Mequinenza, and below the latter town enters Catalonia, where it assumes a south-south-east direction and passes by Tortosa, below which it enters the sea by two branches, the southernmost of which forms the port of Alfaques. [Catalonia.] The whole course of the Ebro, with its numerous windings, is rather more than 400 miles. The valley of the Ebro, lying between the great Pyrenean chain and the highlands of Castile, forms a natural division between the northern provinces of Spain and the rest of the peninsula, and the course of the Ebro has therefore been often assumed as a military line in the wars of that country. Previous to the second Punic war, it formed the line of demarcation between the dominions of Carthage and those of Rome. It afterwards formed the boundary between the dominions of Charlemagne and his successors and those of the Moors. The French in their Spanish wars have repeatedly purposed to make the Ebro the boundary between France and Spain. The Ebro begins to be navigable for boats at Tudela in Navarre, but the navigation is often impeded by rapids and shoals. To avoid these, the imperial canal has been constructed, which begins at Fontellas near Tudela, and running parallel to and south of the river, rejoins it six miles below Zaragoza. It was intended to carry it as far as Tortosa. [Aragon.]

The Ebro receives numerous affluents from the Pyrenean chain, the principal of which are as follows. The Aragon, which rises in the mountains of Navarre and enters the Ebro near Milagro. The Gallego, from the mountains of Jaca in Aragon, enters the Ebro nearly opposite Zaragoza. The Segre, swelled by its numerous affluents, the Cinca, the Noguera Pallaresa, Noguera Ribagorzana, and others, draining a vast tract of country both in Aragon and Catalonia, enters the Ebro below Mequinenza on the borders of the two provinces. On its right bank the Ebro receives, above Zaragoza, the Jalon, joined by the Jiloca, coming from the central highlands between Aragon and Castile. The Guadalope, which comes from the mountains of Teruel in S. Aragon, enters the Ebro above Mequinenza.

EBULLITION. [Boiling of Fluids.]

EBURNA. [Entomostomata.]

ECBATANA (Ἐκβάτανα), the antient capital of Media, founded by Deioces (Herod. i. 98). The genuine orthography of the word appears to be Agbatana (Ἀγβάτανα: see Steph. Byzant. v. Ἀγβάτανα), as it is now written in the text of Herodotus, and, as we are informed by Stephanus, it was written by Ctesias. It appears in the 'Itinerary' of Isidore of Charax under the form of Apobatana. There was a city of the same name in Syria, of uncertain position (Herod. iii. 64), where Cambyses died. [Cambyses.]

Ecbatana was situated, according to the testimony of antient writers, in a plain at the foot of a lofty mountain called Orontes. Herodotus, who had probably seen the place, describes it as built on a conical kind of hill, and consisting of seven circular inclosures or walls, one within another, each wall being higher than that which surrounded it, and the innermost wall, which surrounded the palace, of course the highest of all. Ecbatana being a high and mountainous country, was a favourite residence of the Persian kings during summer, when the heat at Susa was almost insupportable.

Hamadan, which is on or near the site of Ecbatana, is near the parallel of 35° N. lat. and in 48° E. long., in a low plain at the foot of Mount Elwund. Elwund belongs to that mountain-chain which forms the last step in the ascent from the lowlands of Irak Arabi to the high table-land of Iran. [Asia, p. 470.] 'During eight months in the year the climate of Hamadan is delightful; but in winter the cold is excessive, and fuel with difficulty procured. The plain is intersected by innumerable little streams, covered with gardens and villages, and the vegetation is the most luxurious I ever beheld.' (Kinneir's *Persia*, p. 126.) Kinneir says that the summit of Elwund is tipped with continual snow, and seldom obscured by clouds. Hamadan has a large manufacture of leather, and also a considerable trade, owing to its position on the high road from Bagdad to Tehran and Ispahan. According to Kinneir, it has about 10,000 inhabitants. [ASIA, pp. 469, 470.]

The site of Ecbatana has been a matter of dispute; but the dispute has arisen solely because those who have discussed the question either did not know the evidence on which the question must be decided, or did not understand it. The route of commerce between the low country in the neighbourhood of the antient Seleuceia and the modern Bagdad and the high table-land of Iran, is determined by the physical character of the country, and has continued the same from the earliest recorded history of those countries to the present day. The places marked in the 'Itinerary' of Isidore as lying between Seleuceia and Ecbatana are the places indicated by modern travellers as lying on the route between Bagdad and Hamadan. This question is fully discussed in the 4th No. of the 'Journal of Education.'

For further references as to the history of Ecbatana, in addition to those given in the 'Journal of Education,' the reader may consult Bähr's 'Ctesias,' p. 88; the note on Q. Curtius, v. c. 8, ed. Pitiscus, 1708; and Wesseling's note on Herod. i. 98.

ECCLESIASTES, or THE PREACHER, a canonical book of the Old Testament, placed after the Proverbs and before the Song of Solomon. The English title is adopted from that in the Greek Septuagint ('Εκκλησιαστής, *Ecclesiastes*), which is a translation of the Hebrew title קהלת, *Choheleth*, that is, one who calls together or calls out to an assembly—a public declaimer. A review of the various learned interpretations of this term is given in Mr. Holden's work on Ecclesiastes, p. 31. Widely different opinions have been expressed by many biblical critics concerning the author, date, and design of this portion of the Bible. The Rev. G. Holden, in the preface to his learned 'Attempt to illustrate the Book of Ecclesiastes,' 8vo. 1822, observes that, 'In common with most other students, he has felt much perplexed by the many difficulties of this book; that of all the Hebrew Scriptures none present greater obstacles to the expositor; for besides the obscurities possessed in common with the others, it has some peculiar to itself; that, with respect to the nature of the author's argument, style, and design, the opinions of critics and commentators have diverged to incredible distances; and their labours serve rather to perplex than to assist the inquirer.' The general supposition that Ecclesiastes was written by Solomon is apparently warranted by the passages i., 1, 12, 16; ii., 4-9, which designate the author as the son of David, king of Israel, and the greatest possessor of wealth and wisdom in Jerusalem. However, it is not only doubted by some commentators, as Semler (*Apparatus in Vet. Test.*, p. 203), that Solomon is the author, but by many other critics and divines of the greatest learning and reputation it is declared to be a production of the age of or subsequent to the Babylonish captivity (600 B.C.), that is, 400 years after Solomon, who reigned 1000 B.C.: Zirkel and others date it as late as 130 B.C. (Grotius, *Prolegom. in Ecclesiastem*; Hermann von der Hardt, *De Libro Koheleth*; Van der Palm, *Diss. de Libro Ecclesiastes*; Doederlein, *Scholia in Ecclesiastem*; Professor Dathe, *Notæ in Ecclesiastem*; Zirkel, *Untersuchungen in Ecclesiastes*; and especially Jahn, *Introduct. ad V. Test.*; and Eichhorn, *Einleitung in das Alte Test.*, vol. iii.) The writers of the Talmud and Rabbi Kimchi attribute this book, as well as Proverbs and the Song, to King Hezekiah or the prophet Isaiah. Dr. Adam Clarke (*Preface to Ecclesiastes*, in his ed. of the Bible) asserts that the traditionary notion entertained by the Jews and many Christian divines, as Jerome, Huet, Michaelis, &c., that Ecclesiastes was written by Solomon in his old age, after recovering from idolatry and sensuality, is an assumption which never has been nor can be proved to be true; for since it was 'when Solomon was *old*, that his heart was turned away after other gods by his 700 wives and 300 concubines' (1 *Kings*, ii. 3 and 4), and as he died about the age of sixty, the supposition of a final period of philosophical and pious contrition is not warranted by probability. 'The language,' says the same divine, 'puzzles me not a little; Chaldaisms, Syriasms, and Chaldee words are frequent, and the

that of the authors who lived at or after the cap-

Bishop Lowth remarks that the style is peculiar;

n low, exceedingly obscure, loose, unconnected, and resembling conversation. (*Prælect.* 24.) The greatest difficulty in expounding this book consists in ascertaining the proper principle of interpretation; for many passages understood literally *seem* to sanction a belief in the non-existence of a divine Providence (ii. 11, 'All things, time and chance, happen alike to the righteous and the wicked'); in annihilation or materialism (iii. 19, 'A man hath no pre-eminence over a beast; both die alike:' as the dead (ix. 5) have no knowledge and no reward); splenetic repining is apparently sanctioned (iv. 3, 'It is more fortunate not to be born than to be either living or dead'); so voluptuousness (ii. 24, viii. 15, &c., 'Man hath no better thing than to eat, to drink, and be merry,' which is contradicted, (vii. 3,) where sorrow is said to be better than laughter. To clear the author from the imputation of teaching erroneous and contradictory doctrines, and promoting sensuality and despair, it has been suggested that the treatise is a series of counter-positions, or objections and replies. With this view Mr. Holden has composed an elaborate paraphrase of the original text, and by qualifying and judiciously modifying the expressions and interweaving many ingenious explanations, has reduced the whole to consistency. The general opinion of the commentators, that the design of the book is to inquire about the supreme good*, and to show that it consists in religious wisdom, is adopted by Mr. Holden, with the idea also of its consisting of two divisions: the first, to verse 10 of chap. vi. being occupied in setting forth the vanity of all the labours and enjoyments of human life, the second in eulogizing religious wisdom and describing its nature and effects. The learned Desvoeux, in his 'Philosophical and Critical Essay on Ecclesiastes,' 4to. having collected and discussed many fanciful opinions of other expositors with regard to the design of this book, suggests and maintains it to be 'to prove the immortality of the soul and a future state of restitution.' Dr. Graves adopted this opinion; but Mr. Holden rejects and refutes it, remarking that 'the doctrine of a future state is left in great darkness and obscurity, not only in Ecclesiastes, but in all the Hebrew Scriptures, in no passage of which it is announced as a necessary article of faith.' Various fanciful conjectures have been offered in commenting on the figurative language of the last chapter, descriptive of old age. (See Holden, p. 161.) In addition to the works already mentioned, the following may be found useful for reference:—Greenaway's translation of Ecclesiastes; Hodgson's translation; Bishop Reynolds's 'Comment on Ecclesiastes;' Dr. Wardlaw's 'Lectures on Ecclesiastes.' For numerous others, see Watt's 'Bibliotheca Brit.'

ECCLESIA'STICUS, or THE WISDOM OF JESUS THE SON OF SIRAC, an apocryphal book of the Old Testament. It is stated to have been originally written in Syro-Chaldaic, by Jesus, the son of Sirac, a learned Jew who travelled in pursuit of knowledge 130 years B.C. It was translated into Greek for the use of the Jews of Alexandria, by the grandson of the author, or rather compiler, for it is evidently a collection of fragments, written at different times and on various occasions, consisting of meditations and proverbs relating to religion, morals, and the general conduct of human life. But though it is manifest that no methodical plan or arrangement was observed in its composition, the commentators remark that the whole will admit of division into three parts. The first extends to the end of chap. 43, and is occupied in the commendation of wisdom and the statement of moral precepts. The second celebrates the virtues of the patriarchs and prophets of the Jews, and extends to the end of chapter 49. The third part is comprised in the 50th and concluding chapter, and consists of a prayer or hymn, exhorting mankind to the pursuit of wisdom. These meditations display much acuteness of thought, with propriety of diction, and occasionally poetical eloquence. They closely resemble the numerous other oriental proverbs, and especially the collection attributed to Solomon. In the western Christian church this book was highly esteemed; the council of Carthage made it canonical, as the fifth book of Solomon, and the council of Trent confirmed the decision. It was also introduced by the early Protestant reformers into the liturgy of the church of England.

Addison, in the 68th number of the Spectator, observes, that were this collection issued under the name of C

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* See, on the question of the summum bonum, Aristotle's 'Nicomac. Ethics;' Plato's 'Philebus;' Cicero, 'De Finibus;' Stobæus, 'Eclog. Ethic.;' St. Augustin, 'Civitas Dei;' Harris 'On Happiness.'

Sirach, or one of the sages of Greece, it would be regarded among the most brilliant moral treatises ever published. The opinion which attributes it to Solomon is refuted by several allusions to the captivity, showing that some parts at least were written under the monarchs of Babylon (c. 47, &c.), 400 years subsequent to the reign of Solomon. The Greek fathers frequently cite the book of Ecclesiasticus as [illegible], the Wisdom of Jesus; Πανάρετος Σοφία, the Excellent Wisdom; and [illegible], the Rational Discourse. The Latin fathers named it Ecclesiasticus, or the Book of the Church, from its being then appointed to be read in churches. A Syriac and an Arabic version are extant. The Latin version, which is supposed to be of the first century, contains numerous words adopted from the Greek, but differs much from the present Greek text. (*Ecclesiasticus, or the Book of the Church*, by Luke Howard, F.R.S., 1827; Dalrymple, Lord Hailes, *Wisdom of Solomon, or Ecclesiasticus*, 1746; Bauning, *Comment. de Jesu Sirachide Ecclesiastico*, 4to., 1727; Bretschneider, *de lib. Jesu Siracide* (prolegom. pp. 10-34), dates the original compilation 180 B.C.; Horne's *Introduct. to the Bible*, vol. iv.)

ECCREMOCARPUS SCABER, a climbing Chilian half-shrubby plant belonging to the natural order Bignoniaceæ, inhabiting thickets and hedges in its native country, and scrambling among the branches of bushes and small trees. It has an angular cinnamon-brown stem, with pale-green furrowed branches; opposite pinnated bipinnate leaves, with obliquely cordate serrated leaflets, and a terminal tendril; horizontal racemes of tubular orange-scarlet (slightly ventricose) flowers, the limb of whose corolla is narrow and 5-toothed; and remarkable oval compressed pods covered all over with short tubercles, and opening into two thin convex valves, within which is placed a number of thin winged netted seeds. It is a handsome half-shrubby plant, which will live in the open air in the milder parts of England. By some it is called Calampelis scabra.

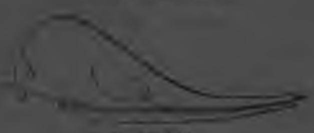
ECHARD, LAWRENCE. It is unknown when this author was born; but his translation of the 'Amphitryo' of Plautus was published in 1694. He was educated at Cambridge, and having taken orders, was presented to a living in Lincolnshire. In 1712 he became archdeacon of Stowe and prebendary of Lincoln. His historical works have long ceased to be read; but his translation of Terence is still frequently purchased by indolent schoolboys, who could not well buy a more unprofitable book. The characters of the elegant and refined Terence are made to utter all the vulgarisms and scurrilities of the eighteenth century: thus we have such expressions as 'the devil's person,' 'damnable roguery,' 'fools' paradise,' constantly before us. Sir Charles Sedley has left a version of Terence's 'Eunuch' somewhat in the same style; but he has had the good sense merely to take the plot of the classic and represent the characters as modern Englishmen; whereas Echard has committed the palpable absurdity of putting his ribaldry in the mouths of Athenian citizens; and to crown all, has written a most self-complacent preface, wherein he acknowledges he could not have followed his author more closely without destroying his design 'of giving an easy comic style.' We should not have been so pointed in our remarks on this worthless book had we not been fully aware that while classical studies form so considerable a branch of education, it is of the utmost importance that the young student should not acquire those incongruous and absurd notions which he cannot fail to imbibe from such works as Echard's 'Terence.'

ECHEVIN, the name given under the old French monarchy to the municipal magistrates of various cities and towns. At Paris there were four échevins and a prévôt des marchands, whose jurisdiction extended over the town and adjacent territory; in the other towns there was a mayor and two or more échevins. In the south of France the same officers were called by other names, such as consuls in Languedoc and Dauphiné, capitouls at Toulouse, jurats at Bordeaux. The last name, that of jurats, is retained in some of the English municipalities. They tried minor causes, laid the local duties or octroi upon imports, had the inspection of the commercial revenues and expenditure, as well as the superintendency of the streets, roads, and markets, the repairs of public buildings, &c. The name échevins seems to have been derived from scabini, a Latin word of the middle ages, which was used in Italy under the Longobards, and in France, Flanders, and other countries under the Carlovingian dynasty. In Holland they are called schepens. The scabini were the assessors to the comites or counts, appointed by the monarch to administer a province or district; and they were chosen among the local inhabitants. Afterwards when charters were given to the communes, the municipal magistrates elected by the burgesses assumed also the name of scabini or échevins. (Ducange, *Glossarium*.)

ECHIDNA (*Cuvier*), Tachyglossus (*Illiger*), a genus of *Monotremes*, *Monotremata* (*Geoffroy*), the third tribe of the order *Edentata* (Cuvier's sixth order of Mammalia), none of which have any incisor teeth in either jaw.

The peculiar structure of the group consisting of *Echidna* and *Ornithorhynchus*, will be treated of under the title MONOTREMES.

Echidna.
Dental formula 0



Skull of Echidna.

Muzzle elongated, slender, terminated by a small mouth furnished with an extensible *tongue*, similar to that of the *Ant-eaters* and Pangolins. *No teeth*, but the palate armed with many rows of small spines directed backwards. *Feet* short, very robust, and formed for digging, each armed with five long claws. *Tail* very short. Body covered with spines like that of the hedge-hog. *Stomach* simple and nearly globular; cæcum moderate. La verge se termine par quatre tubercules.

Of this curious genus zoologists are agreed that only one species has been yet discovered, though two have been recorded; viz. *Echidna Hystrix* and *Echidna setosa*, the so-called two species being the same animal in the clothing of different seasons, or at different periods of age. This species is the *Myrmecophaga aculeata* and *Porcupine Ant-eater* of Shaw, *Ornithorhynchus aculeatus* of Home, *Echidna Hystrix* and *Echidna setosa* of G. Cuvier, *Echidna Australiensis* of Lesson, *Hedge-hog* of the colonists at Sidney.

Size, about that of the common hedge-hog. *Spines* dirty-white for the greatest part of their length, and black at their extremity. *Hair* of a chestnut colour, soft and silky, in such abundance, at a certain season, as to half cover the spines, whilst, at another, the hair entirely disappears.

Food.—Ants, which the animal captures with its extensile tongue.

Habits.—The habits of the Echidna in a state of nature are but little known. It digs for itself burrows, wherein it remains during the dry season, coming out of the earth only during the rains. It is supposed to be capable of supporting a long abstinence, and has intervals of suspended animation (engourdissement), which continue for eighty hours at a time, and recur frequently when the animal is kept in confinement. For protection, the animal is said to be able to roll itself up like a common hedge-hog.

But, if we know little of the natural habits of the *Echidna*, we are indebted to Lieutenant Breton, Corr. Memb. Zool. Soc., for an account of its manners in captivity, and for some suggestions which we hope will be attended to if this article should meet the eye of any one who may have it in his power to put them in practice. If they are carefully followed, we may yet see this most interesting quadruped in the gardens of the Zoological Society in the Regent's Park.

Lieut. Breton had an *Echidna* which lived with him for some time in New Holland, and survived a part of the voyage to England. The animal was captured by him on the Blue Mountains: it is now very uncommon in the colony of New South Wales. It burrows readily, but he does not know to what depth. Its strength he considers as exceeding, in proportion to its size, that of any other quadruped in existence.

Previous to embarkation, Lieutenant Breton fed his *Echidna* on ant eggs (pupæ) and milk, and when on board its diet consisted of egg chopped small, with liver and meat. It drank much water. Its mode of eating was very curious, the tongue being used at some times in the manner of that of the chameleon, and at others in that in which a mower uses his scythe, the tongue being curved laterally, and the food, as it were, swept into the mouth: there seemed to be an adhesive substance on the tongue, by which the food was drawn in. The animal died suddenly off Cape Horn while the vessel was amidst the ice; perhaps in consequence of the cold, but not improbably on account of the eggs with which it was fed being extremely bad.

Lieutenant Breton concurs with MM. Quoy and Gaimard in thinking that there would be little difficulty in bringing the *Echidna* to Europe, and the following plan is suggested by him for effecting its importation.

Previously to embarkation the animal should be gradually weaned from its natural food (ants). This may be done by giving it occasionally ants and ant-eggs, but more generally milk, with eggs chopped very small, or egg alone. It should be kept on shipboard in a deep box, with strong bars over the top, and a door. The box or cage must be deep, because the animal constantly tries its utmost to escape; and, as it possesses very great strength, it is liable to injure itself in its exertions to force its way through the bars. Its excrements are so extremely fetid, that it cannot be kept altogether in a cabin, unless the cage be frequently cleaned. While this is being done, the *Echidna* may be allowed its liberty, but must be narrowly watched, or it will certainly go overboard. It is absolutely necessary that the eggs on which it is fed during the voyage should be as fresh as possible: they can be preserved in lime water. If milk is not to be procured, water must be supplied daily; and egg and liver, or fresh meat, cut small, should be given at least every alternate day. When the weather will permit, it should be fed once a day. Half an egg, boiled hard, and the liver of a fowl or other bird, will suffice for a meal. The animal should be kept warm, and should be well supplied with clean straw. It will be as well to nail two or three pieces of wood (battens) across the floor of the cage, to prevent the animal from slipping about when the ship is unsteady. (*Zool. Proc.*, 1834, Part 2.)

Localities.—Blue Mountains, &c., the environs of Port Jackson, and Van Diemen's Land.

Echidna Hystrix.

ECHI'NADES. [Achelous.]

ECHINASTRÆA. [Madrephylliæa.]

ECHI'NIDÆ, a family of radiated animals, comprehending those marine animals popularly known by the name of *sea-eggs*, or *sea-urchins* (*oursins* of the French).

De Blainville makes the *Echinidea*, the second order of the class *Echinodermata*, and he thus defines the order.

Body oval or circular, regular, sustained by a solid *shell*, which is calcareous and composed of polygonal plates, disposed in radiated order in twenty rows, which are either equal, or alternately and regularly unequal. The shell supports upon proportionable mamillary projections stiff spines which are extremely variable in form, and is pierced by series of pores, forming by their assemblage a kind of ambulacra. It radiates more or less regularly from the summit to the base and gives exit to tentaculiform cirrhi.

Mouth armed or unarmed, pierced in a notch of the shell invariably on the lower side.

Vent always distinct, but offering many variations in its position.

Generative Orifices four or five in number, disposed round the dorsal summit.

Anatomy, Reproduction, &c.—Not completely known, notwithstanding the labours of Réaumur, Klein, Cuvier, Lamarck, De Blainville, Gray, Delle Chiaje, Tiedemann, and Dr. Sharpey, to whose works we must refer the reader. We shall only here observe that the whole of the *Echinidæ* are probably hermaphrodites, and that consequently reproduction is carried on without the aid of a second individual: but this is uncertain. On the European coasts the Echinidæ are observed with their ovaries in a turgescent state in the spring, and we may thence conclude that the time of ovipositing is the summer; the places of deposit are most probably the fissures or cavities of rocks and aggregations of fucus, and the deposit itself is made in one mass. Nothing certain appears to be known as to the development of the eggs, the duration of that development, or of the length of the life of the animal.

Geographical Distribution.—In almost all seas, but more especially in those of warm climates, on rocky or sandy coasts, often free, sometimes sunk in the sand. The species are very numerous.

Habits.—All the *Echinidæ* are locomotive, though their locomotion, which is effected principally by means of their contractile tubular feet, and in a degree by their spines, is rather laborious. Some of the species, which repose on rocks, have a power of eroding the stone so as to make a nidus for themselves, which is generally not deep.

Food.—Animal probably and molecular in the edentulous species. Those whose mouth is armed with teeth are supposed to live on marine plants. Cavolini, at least, says as much of the *sea-eggs* (*oursins*), properly so called.

Utility to Man.—When the ovaries of some of the species are fully developed (*Echinus edulis*, for instance), they are collected as an article of food.

Fossil Echinidæ.

There are few animal remains, with the exception of the shells of the testaceous mollusks, which are better preserved than those of the *Echinidæ*. They occur in a fossil state in almost incredible numbers, and are to be traced through all the formations, from the epoch of the transition series to the present time. Dr. Buckland remarks that he found, many years ago, fossil Echinidans in the carboniferous limestone of Ireland, near Donegal, and that they are rare in the transition formation, become more frequent in the muschel-kalk and lias, and abound throughout the oolitic and cretaceous formations*.

Their abundance may be, in some degree, accounted for by the habits of a great proportion of them, which lead them to bury themselves in the sand, &c., so that their preservation must for the most part be complete. The nature also of the shell and its structure are other causes of fossil durability, for it is almost spathose in parts, while the animal is yet alive. The peculiar fracture presented by the shell and spines is relied on by De Blainville as indicating the place of the *Echinidæ* in the natural series to be with the Encrinites, and not with those *Zoophytaria* which are near the *Pennatulæ*, as some zoologists have thought.

Systematic Distribution.

Breyn, Klein, Linnæus, Leske, Lamarck, Cuvier, Gray, Desmarest, Goldfuss, Von Buch, Agassiz, are the principal zoologists who have undertaken the classification of the *Echinidæ*. De Blainville observes that the relative position of the mouth and the vent, and above all, of the ambulacra, are the principal points on which most of these writers have rested; and as he considers that this mode of viewing the subject has led to approximations not very natural, he proposes a system based on the following grounds:—

1st. On the general form of the body of the animal, which, at first subradiated, becomes, by little and little, completely radiated in all the parts which constitute it.

2nd. Upon the position of the mouth, which, nearly terminal and transverse, or bilabiated, in the first species, becomes completely central and circular in the last.

3rd. On the arming of this mouth, which, completely null in a great proportion of the *Echinidæ*, is, on the contrary, very powerful in the rest.

4th. Finally, on the position of the vent, on the number of ovaries and their orifices, on the nature of the spines and the tubercles which support them, as well as on the disposition of the ambulacra.

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* Bridgewater Treatise.

Synoptical Table of the Genera, according to De Blainville.

Mouth	Subterminal		Spatangus. Ananchites.
	Subcentral	Without teeth ..	Nucleolites. Echinoclypeus. Echinolampas. Cassidulus. Fibularia. Echinoneus.
		Armed with teeth	Echinocyamus. Laganum. Clypeaster. Echinodiscus. Scutella.
	Central; Vent	Infralateral	Galerites.
		Dorsal ..	Echinometra. Echinus. Cidaris.

Sub-Family. I.

Excentrostomata.

Genera. Spatangus.

Body oval, more or less elongated, heart-shaped, wider before than behind, with a furrow more or less profound at the anterior extremity. *Shell* delicate, of little solidity, composed of large polygonal plates, not many in number. *Spines* short, flat, small and scattered. *Ambulacra* incomplete, only four in number. *Buccal orifice* more or less distant, transverse, bilabiated, semicircular; a mouth without teeth. Vent terminal, and rather above than below the border. *Genital pores* four in number, disposed in two pairs. The species are very numerous and are subdivided by De Blainville and others into sections according to their shape, &c. The following is De Blainville's method.

α.

Species whose ambulacra are not petaloid, and form scarcely but two lines, a little broken or bent at their internal side, and which have a rather deep anterior furrow, and the mouth not much in front.

Example, *Spatangus arcuarius.*

De Blainville observes that Mr. Gray places *Spatangus Atropos* in this section; but the former thinks that it notably differs from those placed under it, and places it in the following section.

β.

Heart-shaped species, with five deep and straight dorsal furrows in which the ambulacra are hidden.

Example, *Spatangus Atropos.*

γ.

Species whose ambulacra are petaloid, going from a centre, and which have an antero-dorsal furrow more or less deep, occupying the place of the fifth ambulacrum; the posterior pair shorter than the anterior.

This section is divided into subsections, according to the depth of the ambulacra.

Example of the first (*Spatangus*, Klein, Gray), *Spatangus purpureus.* Example of the second (*Ovum*, Van Phelsum, *Gray*), *Spatangus canaliferus.*

δ.

Species whose anterior furrow is much less deep, or nearly null, and whose ambulacra, more or less petaloid, to the number of four, occupy the greatest part of a sort of dorsal plate circumscribed by a sinuous line without tubercles or spines. (Genus, *Brissus*, Klein, *Gray.*)

Example, *Spatangus pectoralis.*

ε.

Heart-shaped species, rather strongly widened and notched in front, with five distinct and truncated ambulacra. Example, *Spatangus gibbus.*

ζ.

Species whose anterior furrow is still distinct; whose ambulacra, to the number of four, are marginal, and sometimes complete, or reaching up to the mouth; and whose genital pores are five. This section is subdivided into two, according to the extent of the ambulacra: the first, (example, *Spatangus subglobosus*,) with ambulacra only reaching the circumference; the second, (example, *Spatangus* [illegible], *Ananchites* [illegible], Lam.;) with ambulacra reaching to the border.

Geographical distribution.—In almost all seas, including our own. Numerous in the Mediterranean.

Habits.—Not known, but they seem to live constantly burrowed in the sand.

Food.—De Blainville supposes that the *Spatangi* are nourished with the animal matters which are mingled with the sand; for their intestinal canal, which is thin as a spider's web, was always found by him full of fine sand.

FOSSIL SPATANGI.

The species are numerous in the chalk and cretaceous group, and occur in the oolitic group.

Ananchites. (Fossil only.)

Body oval in its longer diameter (from before backwards), rounded and a little wider, but without a furrow, anteriorly, subcarinated posteriorly, conical, elevated at its summit, which is rounded, entirely flat below, covered with a very few small scattered tubercles. Ambulacra, to the number of five, rather large, divergent, comprised between double lines of pores but little approximated, and scarcely overpassing the border. *Mouth* and *vent* subterminal and inferior. De Blainville subdivides this genus into two sections: the first, with the ambulacra prolonged up to the border (*Ananchites*, Lam.), example, *Ananchites ovata*; the second, with the ambulacra prolonged up to the mouth (*Echinocorys*, Leske, Gray; *Galea*, *Galeola*, Klein), example, *Ananchites pustulosus*, *Echinocorytes pustulosus*, Leske. M. Defrance enumerates 12 species; to these are to be added M. Risso's three species, *A. certosus*, *A. cylindrica*, and *A. Stella*, if they be distinct. De Blainville observes that Lamarck's *Ananchites elliptica* most probably does not belong to this division, and that his *A. Cor avium* belongs to the same division as the *Violet Spatangus.* Goldfuss has described some new species.

Sub-Family II.

Paracentrostomata Edentata.

Genera. Nucleolites. (*Fossil only.*)

Echinobrissus of Breyn and Gray, adding the *Cassiduli.*

Body oval or heart-shaped, wider and with a large furrow behind, rather convex, the summit subcentral and moderately elevated above, somewhat concave below; covered with small, equal and scattered tubercles. *Ambulacra* to the number of five, subpetaloid, open at the extremity, dorsal and marginal, and continued by as many furrows up to the *mouth*, which is inferior, subcentral, and anterior. *Vent* subcentral, above, in the furrow. *Genital pores* to the number of four. Example, *Nucleolites depressus*, *Spatangus depressus*, Leske, Klein; *Clypeus lobatus*, Fleming.

Locality, &c.—The species are tolerably numerous and are frequent in the chalk, but are also found in the beds anterior and posterior to it.

Echinoclypeus. (Fossil only.)

Body depressed or conical, circular or inclining to oval, with a furrow behind, convex and with a subcentral summit above, rather excavated below, formed of distinct plates and covered with very small equal tubercles. *Ambulacra* to the number of five, dorso-marginal, subpetaloid; the double rows of pores united by a transverse furrow. *Mouth* subcentral, a little more anterior, pentagonal, with five converging, ambulacriform furrows. *Vent* entirely above, behind the summit, and at the origin of the posterior furrow. Genital pores to the number of four.

De Blainville remarks that this generic section, established by Klein under the name of *Clypeus*, has been confounded by Lamarck with his *Galerites*, which belong to an entirely different division of the *Echinidae*; and he observes that they might much better be confounded with the *Nucleolites*, after the arrangement of Defrance. He adds that he should not be surprised if the *Cassidulus scutella* belonged to this division.

Echinolampas, Gray. (Echinanthus? Leske.)

Body oval or circular, depressed, subconvex above, rather concave below, rounded and widened forward, rather narrowed towards the anal extremity, composed of great polygonal plates and covered with spines, probably very small. *Ambulacra*, to the number of five, subpetaliform, not closed at their extremity, and nearly approaching the border. *Mouth* round, subcentral, and nevertheless a little anterior. *Vent* entirely marginal, terminal. *Genital pores* four only in number. Example, *Echinolampas oviformis* (recent).

The form occurs fossil; see, for instance, *Trans. Geol. Soc.* (*Second Series*) i., tab. 3, fig. 3, 4, 5. (*Echinonüus Lampas.*)

Cassidulus.

Body oval, more or less depressed, composed of indistinct plates and covered with small spines. *Ambulacra* five, dorsal, rarely marginal. *Mouth* below, submedian, in a stelliform notch. *Vent* postero-dorsal, or above the border. *Genital pores* four.

De Blainville subdivides this genus into the following sections:—

α.

Species whose ambulacra form a dorsal star, and whose mouth is at the bottom of a stelliform impression. Example, *Cassidulus Lapis Cancri.*

β.

Species whose ambulacra are prolonged to the border and not closed. Example, *Cassidulus Australis.*

γ.

Species whose ambulacra are not known to De Blainville. Example, *Cassidulus scutella.*

De Blainville observes that this genus (Lamarck's) is evidently artificial; for that the position of the vent cannot furnish any character of much importance. He remarks that there is but one recent species; the others, to the number of nine, according to Defrance, are fossil, from the beds anterior to the chalk, and with some little doubt, from more recent formations. Goldfuss unites the genus with *Nucleolites.*

Fibularia.

Body globular, but rather higher than it is wide, ribbed, as it were, with about twenty ribs, formed probably by so many ranks of polygonal scales, and covered with very fine spines. *Ambulacra* five, very short, and not shut at the extremity. *Mouth* round, subcentral. *Vent* inferior and much approximated to the mouth. *Genital pores* unknown. Example, *Fibularia craniolaris.*

De Blainville observes that this genus was established by Van Phelsum and by Leske, under the denomination of *Echinocyamus*, adopted by Mr. Gray. De Blainville only leaves under it *F. craniolaris* and the seven or eight but little distinguished or indistinct species which Van Phelsum established, and probably the *C. trigona* of Lamarck, but he says that he has seen none of them; and he adds that, in the genus as defined by him, only living species have yet been found.

Echinoneus.

Body rounded or oval, generally excavated below, composed of plates often distinct and covered with small spines. *Ambulacra* five, large, complete, radiating from the dorsal centre to the mouth, and formed by ambulacral lines, which are very close and impressed. *Mouth* central or subcentral, without teeth, and pierced in a subtriangular hole of the shell. *Vent* towards the border below or even above, in a longitudinal and subsymmetrical hole of the shell. *Genital pores* four.

De Blainville subdivides the genus into the following sections:—

α.

Oval species, with the anal hole longitudinal and below. Example, *Echinoneus minor.*

β.

Circular species, with the vent below and round. (*Discoidea*, Gray.) Example, *Echinoneus subuculus.*

γ.

Oval species, with the vent entirely marginal, and the genital pores to the number of seven? Example, *Echinoneus ovalis.*

δ.

Circular species, which are depressed and have a margino-dorsal, nonsymmetrical anal opening. Example, *Echinoneus cassidularis.*

De Blainville observes that no *Echinoneus* with the anal opening below is known in a fossil state; so that in the genus, as defined by Lamarck, there are no fossil species according to Defrance; but that in his (De Blainville's) method of arrangement there are many; and he remarks that Goldfuss figures four species from the chalk, but he adds a query whether they belong to this genus.

Sub-Family III.

Paracentrostomata Dentata.

Mouth subcentral, in a regular notch of the shell, and provided with teeth.

Genera. Echinocyamus.

Body depressed, oval, wider behind than before, a little excavated below, covered with rounded tubercles pierced at the summit and rather large in proportion, supported internally by five double inferior ribs, terminating round the buccal notch by as many simple apophyses. *Ambulacra* dorsal, not marginal, completely open at the extremity, a little enlarged, and forming a sort of cross with dilated branches. *Buccal opening* subcentral, regular, armed with five teeth as in *Clypeaster*. *Vent* below, between the mouth and the border. *Genital pores* four. Example, *Echinocyamus minutus.*

De Blainville states that he characterized this genus from a considerable number of individuals of a very small species found in the intestines of a turbot, and which occurs in great quantity in the sand of the coasts of the English Channel, according to Pallas, both on the French and English shores. He adds that, very probably, it is the *Fibularia ovulum* of Lamarck; and that, without doubt, *Fibularia Tarentina* belongs to this genus, as well as *Echinoneus Placenta* of Goldfuss.

Lagana, Gray. (*Echinodiscus*, Van Phelsum, Leske.)

Body depressed, circular or oval lengthwise, a little convex above, concave below, with an entire disk and borders, composed of plates but little distinct and covered with scattered spines. *Ambulacra* five, regular, petaloid, shut or nearly so at the extremity, with the pores of each side united by a furrow. *Mouth* median in the middle of a hole, with converging furrows and furnished with teeth. *Vent* inferior, pierced in a regular hole, situated between the mouth and the border. *Genital pores* five. The genus is thus sub-divided by De Blainville:

α.

Circular species. Example, *Lagana orbicularis.*

β.

Oval species. Example, *Lagana ovalis.*

γ.

Polygonal species. Example, *Lagana decagona.*

The genus approximates to *Clypeaster*, under which Lamarck arranges the species.

Clypeaster.

Body much depressed, rounded and rather thick on the borders, sometimes incompletely orbicular or radiated, enlarged towards the anal extremity, composed of large and unequal plates, covered with very small, equal, scattered spines supported on very small tubercles pierced with a pore. *Ambulacra* constantly five in number, dorsal, petaloid, the two rows of pores of each branch united by a furrow. *Mouth* central or sub-central, at the bottom of a sort of tunnel, formed by five grooves and armed with five teeth. *Vent* terminal and marginal. *Genital pores* to the number of five.

Living species few. *Localities*, the seas of warm countries—in Asia and America.

Example, *Clypeaster rosaceus.*

Fossil species more numerous and generally from the tertiary beds. Defrance enumerates eleven. Goldfuss figures ten new ones; but De Blainville adds a query whether they are all of this genus.

De Blainville states that this division of Echinidans was established by Breyn under the name of *Echinanthus*, which Mr. Gray has retained, and under that of *Echinodon* by Van Phelsum.

Echinodiscus.

Body rounded, depressed, sub-quinquelobated (the posterior lobe a little notched in the median line), rather conical above, concave below, composed of plates in twenty rows, placed two and two. The *ambulacraires* narrow, and covered with very small, fine, close-set spines. *Ambulacra* to the number of five, diverging by the complete separation of each double line of pores. *Mouth* median, round, towards which converge five straight and stelliform furrows. *Vent* marginal. *Genital pores* to the number of four. Example, *Echinus Parma.*

Locality of the species.—De Blainville observes that it was generally believed that all the species were the inhabitants of warm climates; but he quotes Dr. Fleming for a statement that Professor Jameson had received *Echinodiscus placenaria* (*Scutella placenaria*, Lam.) from the Isle of Foulah, where it would, nevertheless, seem to be very rare.

De Blainville further remarks, that no fossil species have as yet been discovered, unless *Scutella lenticularis*, Lamarck, belongs to this genus, which he thinks probable. He considers that these *Echinidæ* appear to form the passage to the Polygonal Asteriadans.

Scutella. (*Mellita*, Klein; *Echinodiscus*, Leske.)

Body irregularly circular, wider behind, extremely depressed, borders nearly sharp-edged, sub-convex above, a little concave below, composed of large polygonal scales and covered with very small, uniform, and scattered spines. *Ambulacra* five, more or less petaloid, the two rows of pores of each branch united by transverse furrows, which make them appear striated. *Mouth* median, round, furnished with teeth, and towards which converge five vermiculate furrows more or less ramified and sometimes bifid from the base. *Vent* always inferior and at some distance from the border. *Genital pores* four.

LIVING SPECIES.

α.

Species whose disk alone is perforated. Example, *Scutella hexapora*.

β.

Species whose disk and borders are perforated. Example, *Scutella tetrapora*.

γ.

Species whose border only is notched. Example, *Scutella aurita*.

δ.

Species whose disk and border are entire. Example, *Scutella integra*.

ε.

Species whose disk is perforated and their border multidigitated. Example, *Scutella octodactyla*.

ζ.

Species whose disk is imperforate and the border multiradiated. (*Demi-soleils.*) Example, *Scutella dentata*.

Localities.—The living species whose habitat is known are foreign, and the South Seas appear to be their principal locality. Nevertheless, as De Blainville observes, we ought to remember that Defrance, in the description of a fossil species, *Scutella Hispana*, says, that it bears great resemblance to a species that lives in the English Channel and which is found on the coasts in the department of Calvados. De Blainville adds, that he has not seen this species, and that it is the first time we find it stated that a *Scutella* exists in our seas. None of the English, Italian, or French authors whom he consulted mention it.

FOSSIL SPECIES.

Tolerably numerous and occurring generally in the *calcaire grossier* of Paris, Grignon, and the environs of Nantes; none as yet recorded in any other beds than those posterior to the chalk.

Sub-family IV.

Centrostomata.

Mouth quite central. *Summit* median. *Body* regularly oval or circular, covered with tubercles and mamillæ, and consequently with spines of two sorts. *Vent* variable, ordinarily medio-dorsal.

Genera. *Galerites* (Fossil only) *Conulus*, Klein; *Echinoconus*, De Blainv.

Body nearly regularly circular or polygonal, entirely flat below, convex and often conical with the summit median above, formed of very dissimilar plates and covered with tubercles of two kinds. *Ambulacra* complete, narrow, to the number of five or four, dorso-buccal. *Mouth* central and probably armed. *Vent* inframarginal. *Genital pores* to the number of five.

α.

Species with four ambulacra and consequently with six rows of plates. Example, *Galerites quadrifasciatus*.

β.

Species with five ambulacra. Example, *Galerites vulgaris*.

γ.

Species with six ambulacra. Example, *Galerites sexfasciatus*.

The genus is often found silicified and in casts. The greater portion belong to the chalk and a small number to the beds anterior to the chalk. None have as yet been found in the more recent strata.

Echinometra. (Gray.)

Body thick, solid, transversely oval, a little depressed, convex, with the summit (which is median) flat above and arched below, covered with mamillated tubercles of two sorts and bearing diversiform, but always strong and large spines. *Ambulacra* five, enlarging themselves below. *Buccal opening* of the shell large, transverse, with very powerful auricles on its internal circumference. *Five sharp teeth* at the mouth, with a complicated apparatus, as in *Echinus*. *Vent* medio-superior, or opposed to the mouth. *Genital pores* to the number of five. Example, *Echinometra atrata*.

Localities.—The seas of warm climates. Unknown in those of England and France.

No fossil species known.

Echinus.

Body in general very regularly circular or sub-polygonal, sometimes slightly transverse, composed of twenty radiated rows, alternately unequal, of polygonal plates bristled with diversiform spines of two kinds, and supported on imperforate mamillated tubercles. *Ambulacra* constantly to the number of five and complete. *Mouth* central, armed with five pointed teeth, supported upon a very complicated internal apparatus. *Vent* median, superior, or exactly opposite to the mouth. *Genital pores* to the number of five.

Food.—The food is generally believed to consist of mollusks and crustaceans. Tiedemann found in *E. Saxatilis* small univalve and bivalve shells entire among the excrements, as well as fragments of larger ones. Bosc is said to have witnessed an Echinus in the act of seizing and devouring a small crustacean. Dr. Sharpey usually found in the intestine of *E. esculentus* small morsels of sea-weed, for the most part encrusted with *flustra*; and he says that the excrements, which are in the form of small round pellets about the size of peppercorns, consist chiefly of sandy matter with fragments of shells. But he adds that it would be difficult to say whether these are the remains of digested mollusca or merely a portion of the usual testaceous debris so abundant in sand and mud.

α.

Arbacia, Gray; *Echinocidaris*, Desmoulin.

Species perfectly regular, ordinarily depressed; areæ very unequal; ambulacraires very narrow, bordered by ambulacra nearly straight, and composed to the right and left of a double series of approximated pores; auricles divided and spatulate. Example, *Echinus pustulosus*.

β.

Regular species, more or less convex, but, for the rest, diversiform; areæ sub-equal, bordered by a double series of pores, forming at the exterior, denticulations more or less marked and each with three pairs of holes.

De Blainville subdivides this section into three, with still further subdivisions depending on the non-fissured or more or less fissured angles of the buccal opening of the shell, and other variations. He states that he has been able to study a great number of living species, and though many have been only known to him by means of the shell, he has been able, he says, to find constant specific characters; 1st, in the proportion of the ambulacral and anambulacral areæ; 2nd, in the number of lines of double pores which limit the ambulacra; 3rd, in the number of those double pores which form the festoons of these lines; 4th, in the form of the auricles, serving for the insertion of the muscles of the dental apparatus; 5th, in the disposition of the border of the buccal orifice. He states as a result, that though he has indicated nearly double the number of species pointed out by Lamarck, they are much more easily recognized.

Localities, Habits, &c.—The form is widely diffused, and there are species in most European seas. The Mediterranean produces some very fine ones. They live free at the bottom of the sea at considerable depths, or on the rocks of the coast in the midst of fuci. They lay an immense quantity of eggs.

FOSSIL ECHINI.

Desmarest distinguishes thirteen species from the beds anterior and posterior to the chalk. Risso gives one new from the environs of Nice, and Goldfuss nine from Germany.

Cidaris.

Body circular, regular, more or less elevated or depressed, composed of polygonal plates, covered with mamillated tubercles constantly perforated at the summit, and supporting spines of two kinds: one very long and sharp, the others short and nearly squamous. *Ambulacra* complete, to the number of five. *Mouth* below, central, furnished with five pointed teeth. *Vent* superior and central. *Genital pores* to the number of five.

α.

Subspheröidal species, more elevated than wide, with very narrow ambulacral areæ; the lines of double pores sinuous. (*The Turbans.*) Example, *Cidaris imperialis.*

β.

Orbicular species, depressed; ambulacral areæ less narrow, bordered by straight ambulacra; spines ordinarily fistulous. (*Diadema*, Gray.) Example, *Cidaris Diadema.*

γ.

Orbicular species, very depressed; interambulacral areæ equalling the half of the others, and bordered by straight and very large ambulacra. (*Astropyga*, Gray.) Example, *Cidaris radiata.*

Localities.—Seas of the southern hemisphere. Two species already known in the seas of Britain and France, one on the coasts of Scotland, rare; the other very common in the Mediterranean.

FOSSIL SPECIES.

Cidaris occurs in a fossil state in the chalk and the anterior beds. Defrance mentions three, but hardly characterizes them. Risso adds two new ones; Fleming four; and Goldfuss has figured and characterized nineteen.

Mr. Gray (*Proceedings of the Zoological Society*, 1835) divides the genus *Echinus*, as restricted by Lamarck and modern authors, into what he considers four natural genera, adapted to facilitate the distinction of the species of this extensive group. He regards this distinction as of the more importance, inasmuch as some of the characters which had been used for this purpose, such as the number of the *tesseræ* and of the pores in the *ambulacra*, have been found to be inconstant; the number of these increasing, as they are now known to do, with the age of the specimens. The following is Mr. Gray's subdivision:—Genus 1. *Arbacia.* This corresponds with section A of M. de Blainville. Example, *Arbacia pustulosa* (*Echinus pustulosus*, Lam.) Genus 2. *Salenia*, only known in a fossil state, and hitherto confounded with *Cidaris*; but its tubercles are not pierced. Example, *Salenia scutiger* (*Cidaris scutiger*, Munst.) Genus 3. *Echinus* containing sections B*, C, E, and G of De Blainville. Mr. Gray divides it into two sections:—1. The species with narrower ambulacra and with the pores moderate and approximated, which is subdivided into *those with a subintegral mouth* (type, *Echinus esculentus*) and *those with the mouth deeply incised.* (Example, *Echinus excavatus*, Lam.) 2. The species with wide ambulacra; the pores separated by small tubercles; the mouth five-incised. Example, *Echinus ventricosus*, Lam. Genus 4. *Echinometra*, containing sections B**, D, and F of De Blainville, as well as the Echinometra of that author. In this genus Mr. Gray observes the ambulacral plates may be considered as being composed of five or more doubly-pierced pieces, which form an arched line round the outer edge of the *tessera*, with a single pair of pores at its lower inner angle. Mr. Gray stated that he had formerly separated from the *Echini* some of the species of this genus, which are peculiar for their oblong form, and that the genus so proposed by him had been adopted by M. de Blainville; but a much more extended examination had convinced Mr. Gray that individuals of the same species vary from roundish to oblong; and therefore, having observed many round species agreeing with the oblong ones in the peculiar character of the *ambulacra*, he has united them to the former under the same name. Mr. Gray remarked, as throwing doubt on the bilaterality of the *Echinidæ* attempted to be established by M. Agassiz, that the spongy ovarial plates which that gentleman regarded as the mark of the hinder part of the *Echinidæ*, is always placed on one side or the other of the longer axis of the oblong species. See also Mr. Gray's paper on the genera of these animals in the 'Annals of Philosophy;' and Dr. Sharpey's article 'Echinodermata' in the 'Cyclopædia of Anatomy and Physiology.'

ECHINOBRI'SSUS. [ECHINIDÆ, p. 259.]

ECHINOCACTUS, a genus of Cactaceous plants, with the stem of an ovate or spheroidal form, the sides being divided into many ribs, upon whose projecting angles are stationed at short intervals little spiny stars, which are the rudiments of leaves, and from whose centre the flowers appear. The latter consist of numerous sepals collected into a tube, an equally large number of petals, numerous stamens, and a filiform style divided into many lobes at the point. The species are very remarkable for the singular forms of their stems, and for the curious manner in which their spines are arranged. They are often moreover conspicuous for the beauty of their large flowers. The genus is extremely near Cereus, from which, according to De Candolle, it only differs in having the sepals and petals distinct from each other, not united into a tube. But as Cereus triangularis has its sepals distinct, and all the Echinocacti have more or less of a tube, we consider it better to limit the latter to such species as have a depressed or spheroidal form. With such a limitation the Echinocactus Eyriesii, one of the most beautiful of plants, will really belong to the genus Echinocactus, of which it has all the habit; otherwise it would be a Cereus, to which its stems bear but little resemblance. Most of the species are natives of Mexico and the West Indies. A few are found in Brazil.

Echinocactus Eyriesii.

ECHINOCIDARIS, p. 261.

ECHINOCLY'PEUS. [ECHINIDÆ, p. 259.]

ECHINOCO'NUS. [ECHINIDÆ, p. 261.]

ECHINO'CORYS. [ECHINIDÆ, p. 259]

ECHINOCY'AMUS. [ECHINIDÆ, p. 260.]

ECHINODE'RMATA. Lamarck made his *Radiaires* *Echinodermes* consist of three sections. 1st, the *Stellerideans* (star-fishes), including *Comatula*, *Euryale*, *Ophiura* and *Asterias*; 2nd, the *Echinidæ*; and 3rd, the *Fistulideans*, comprehending *Actinia*, *Holothuria*, *Fistularia*, *Priapulus* and *Sipunculus.*

Cuvier's *Echinodermes* form his first class of zoophytes, and this class is divided into two orders, viz., 1st, the *Pedicillated Echinoderms*, containing the great genus *Asterias*, and its subgenera the *Encrinites*, the *Echinidæ*, and *Holothuria*; and 2nd, the *Footless Echinoderms*, consisting of *Molpadia*, *Minyas*, *Priapulus*, the *Lithoderms*, *Sipunculus*, *Bonellia*, and *Thalassema*, with its subgenera *Echiurus* and *Sternaspis.*

De Blainville's *Echinodermata* are placed as his first class of *Actinozoa*, and are divided into three orders: 1st, *Holothuridea;* 2nd, *Echinidea* [ECHINIDÆ]; 3rd, *Stelleridea*, embracing the *Encrinites* as well as the *Free Starfishes*, &c.

The *Echinodermata* belong to the Cycloneurose subkingdom.

ECHINODISCUS. [ECHINIDÆ, p. 260.]

ECHINOLAMPAS. [ECHINIDÆ, p. 259.]

ECHINOMETRA. [ECHINIDÆ, p. 261.]

ECHI'NONEUS. [ECHINIDÆ, p. 260.]

ECHINO'PORA. [MADREPHYLLIÆA.]

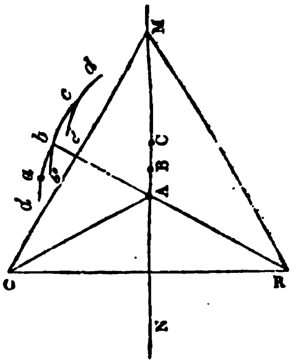
ECHI'NORODON. [ECHINIDÆ, p. 260.]

ECHI'NUS. [ECHINIDÆ, p. 261.

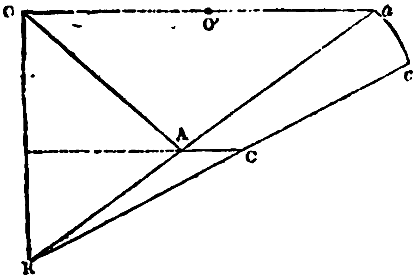
ECHI'TES, a genus of twining Apocynaceous plants inhabiting tropical countries. They have handsome yellow or white corollas, and are moreover remarkable for the singular fruit, which consists of two divaricating woody podlike follicles containing a large number of silky seeds. They are dangerous lactescent plants of no known use.

E'CHIUM, an irregular-flowered genus of Boraginaceous plants, with handsome campanulate corollas. Echium vulgare is the most striking of our wild herbaceous plants; many species found at the Cape of Good Hope are shrubs.

ECHO. (ἠχὼ, ἦχος, *sound*). When sonorous undulations are propagated from any origin through the elastic medium of the air, the spherical wave-like surface then generated conveys the sound through the circumjacent space, and moves from its origin and centre with a velocity of about 1125 feet in a second, at the ordinary atmospheric pressure and temperature; for the velocity of undulations propagated through elastic media depends only on their indices of elasticity and not on their intensity. [ACOUSTICS.]



Suppose the point O to be the origin of a sound which in its progress encounters a plane obstacle NM; if this plane be sufficiently extended, a point M may be easily found which the sound will have just reached at the end of a given time. The waves which have previously reached the nearer points A, B, C, being precluded from advancing, are there reflected, that is, new spherical undulations $a'ab$, $b'bc$, $c'cd$ are generated from A, B, C as centres, and their radii at the moment we have spoken of are respectively $Ab = OM - OA$, $Bc = OM - OB$, $Cd = OM - Oc$, and it is easily seen that all these spherical surfaces originating from A up to M and existing simultaneously, may be exactly enveloped by a single portion of a spherical surface of which the centre is placed in a position R corresponding to O in respect to its distance from NM, but at the opposite side of the obstacle; this spherical surface, of which the radius is RM, is the true returning wave at that moment, and being impressed on the auditory organs, so as to be distinguished from the original sound, is called the echo.



When a sound originates at a point O, and is reflected by a plane obstacle AC, the reflected pulsation of the air occupies the space of a conical frustum $aACc$, the vertex of the cone R being situated symmetrically with O at the opposite side of AC. In order that a person may hear the echo of his own sounds, it is therefore necessary that his situation may be at a point O′ in a perpendicular to AC; and that a second person may hear the echo of the voice of another at O, he must be situated in the frustum $aACc$, so that the angles of incidence and reflection of the sound which reaches his ear may be equal; in both cases the distance from AC must be sufficiently great to distinguish between the original and the reflected sound.

Hence it follows, that wherever a person is situated, the echo of a single sound necessarily follows and cannot precede the original sound, for the two sides OA, Aa are greater than the third Oa through which the direct sound is propagated, and the velocities are in both cases alike.

However, the echo of a continued sound or note may be heard in the inverse order of time to that in which it was generated, provided the origin of the sound moves more rapidly towards the hearer than the rate at which sound travels. Thus a flash of lightning moving towards a person will produce a roll of thunder which, echoed by clouds, will be heard as it were backwards; but if the direction of the flash be such that the points of its current are nearly equidistant from the auditor, an instantaneous and intensely loud clap will be substituted for a continued roll.

The murmuring sound produced by the discharge of great guns is the succession of echoes from the particles of vapour floating in the atmosphere, and when the discharge is effected under a dense cloud, the echoes are stronger and better reflected, and a noise resembling a thunder-roll may then be heard. The whizzing of a bullet is attributed to its impinging in a state of rapid rotation on particles of vapour.

The time intervening between the primitive sound and its echo has sometimes been employed in determining the distance from the observer to the reflecting object, allowing 571 feet for each intermediate second of time; but like all methods dependent more on individual judgment than mechanical measurement, this process must be liable to considerable irregularities.

When several objects reflect sound, the number of echoes is greatly multiplied, not only from the primary echoes of each, but also from secondary and tertiary echoes by second and third reflections of returning waves against the reverberatory obstacles: each re-echo consists of only portions or frusta of the preceding; their intensities therefore diminish, and they gradually die away upon the ear, in the same manner that the images become obscure and by degrees imperceptible in consequence of the diminution of light when we look between two opposite and parallel plane mirrors.

The first echo heard in such circumstances is by no means necessarily the loudest. Taking any ellipse of which one focus is the origin of the sound and the other the place of the auditor, it is a well-known property of this curve that right lines drawn from the foci to any point in it make equal angles with the tangent at that point. Conceive now this ellipse to rotate round the line joining the foci so as to form a prolate spheroid, then sound emanating from one focus and reflected by a portion of the surface will be directed after reflection to the other, and its intensity will depend on the solid angle subtended at the focus by the reflecting body. Each echoing body may be conceived as a portion of such a spheroidical surface, taking a great axis major to comprehend the more distant bodies; and since the sum of the solid angles subtended by the more distant reflectors may be greater than those given by the nearer, the echo produced by them, though not reaching the ear as soon as that of the nearer, may, under such circumstances, be louder, bearing in mind in our estimate that this intensity has a source of diminution in the increase of distance. This case frequently occurs in places encompassed by chains of mountains, as the Killarney and Welsh lakes, &c.

When the succession of echoes from several bodies is sufficiently rapid, a continued sound or note may be produced, though the original sound was merely momentary; and when not sufficiently rapid for this purpose, a clamorous noise is produced, and hence Echo with her thousand tongues and babbling propensities has furnished matter for poetic imagination from Ovid to Shakspeare. As a single *ha* may be converted into an imitation of a stunning laugh, the romantic and echoing regions inhabited by the Scandinavian races materially assisted their untutored imaginings in attributing this appalling music to the aërial revelries of invisible hags or witches.

But when, as in the case of the electric fluid, the original cause of sound may be said to exist simultaneously through an extensive tract of an excited atmosphere, a sound perfectly continuous and majestic is produced in the thunder-roll, which may frequently be heard again echoed by neighbouring clouds, or awfully prolonged by repeated reflections from an amphitheatre of mountains.

A similar effect of rapidly repeated echoes may be perceived in the prolonged tread and ringing sounds which we hear when walking in stillness through long galleries, cloisters, and other narrow passages with parallel sides, particularly when the air is confined; but hangings and carpetings, yielding to the impulse of the sonorous waves, or stifling them by a multitude of interior reflections, together with open windows or much furniture, diminish these effects to a great extent.

The distribution of sound in public edifices, so that the echoes may be most advantageously brought to strengthen the original sound, is a subject practically deserving of much attention. For some sensible observations on the errors of architects in this respect, we must refer to Sir J. Herschel's treatise on Sound. Certainly the unlucky error of placing the confessional in the cathedral of Girgenti in a focus conjugate to another and unenclosed part of the church, by which Echo was instrumental in informing a husband of the infidelity of his spouse, and the parabolic reflector of a late ingenious clergyman at Cambridge, which had the effect of completely stunning him, however impartially his voice was distributed to his congregation, are not inconveniences of such common occurrence as those contrivances by which a part of an audience in a church or theatre possesses a monopoly, while the remainder witness the ceremony or performance in dumb show.

A ludicrous anecdote, mentioned by Lord Bacon, of a Frenchman calling out Satan, and being answered Va-t'en, led him to assert that the letter S was not echoed, and this assertion has been copied by several cyclopedists. The fact is, that S being in a great measure a breathing, the distance necessary for the production of a distinct echo is too great to render it audible, owing to its small intensity; but when its echo is taken at a small distance, the effect is to increase the sound, and this very disagreeable prolongation is very perceptible in churches whenever persons in repeating the service make use of this letter. The whispering gallery of St. Paul's is another instance of this error, for a low whisper uttered at one end is conveyed by successive reflections along its curved roof, and being again concentrated at the other end, may be distinctly heard.

When the reflecting surfaces, instead of plane, are curved, as in caverns, grottos, rocks, or ruined buildings, the reflected sound will be most intense at the foci, or the points which would be most enlightened *by reflection* if a luminous body were substituted in the place of the original source of sound.

Whatever may be the figure of the echoing surface, the total path traversed by a wave in a given time before and after reflection taken together is constant (and in different times is proportional to the time); therefore a small portion of a plane section of the echoing surface is common also to an ellipse having one focus at the origin of sound, the other in the returning wave, and the axis major equal to the space traversed by sound in a given time. Hence, first, the plane sections of the returning wave are the loci of the second foci of a series of ellipses, having a common focus and equal axes major, and all touching the section of the echoing surface; and, secondly, the figure of an obstacle necessary to produce a given wave will be found by taking the curve which touches a series of ellipses having their second foci in this wave surface and their first focus and axes major as before: this, strictly speaking, should however be confined to surfaces of revolution.

E'CIJA, a town of Andalusia, in the intendencia or province of Sevilla, situated on the river Genil, in a fine plain, on the high road from Sevilla to Cordova, about 55 miles north-east of the former city. Its antient name was Astigis; the Romans afterwards gave it the name of Colonia Augusta Firma. The name of Ecija was given to it by the Moors (Miñano). Ecija has a population of 34,000 inhabitants, many churches and convents, several hospitals, and other public buildings, and a very fine promenade along the banks of the Genil, adorned with fountains and statues. It is the residence of a corregidor and an alcalde mayor. The territory is rich in corn and olives; there are also some manufactories of woollens and linens. Ecija is the birth-place of Luis Velez de Guevara, a Spanish dramatist of the seventeenth century. There are several Roman inscriptions and a few other remains of antiquity.

ECKHEL, JOSEPH HILARY, an eminent antiquary and numismatist, was born at Entzersfeld, in Austria, January 13, 1737. His father, who was in the service of Count Sinzendorf, sent him at a very early age to the Jesuits' College at Vienna, where, in 1751, he was enrolled in their society. He studied philosophy, mathematics, divinity, and the learned languages; but devoted himself chiefly to antiquities and medals. His skill in the latter induced the superiors of the college, a few years afterwards, to give him the place of keeper of their cabinet of medals and coins. In 1772 he went to Italy, where the grand duke of Tuscany, Leopold II., engaged him to arrange his collection; and on his return to Vienna, in 1774, he was appointed director of the Imperial Cabinet of Medals, and professor of antiquities. In 1775 he published his first work upon his favourite study, entitled 'Numi veteres Anecdoti, ex Museis Cæsareo Vindobonensi, Florentino Magni Ducis Etruriæ, Granelliano nunc Cæsareo, Vitzaino, Festeticsiano, Savorgnano Veneto, aliisque,' 4to Vienna. This was followed in 1776 by 'Catalogus Musei Cæsarei Vindobonensis Numorum Veterum, distributus in partes ii. quarum prior Monetam Urbium, Populorum, Regum, altera Romanorum complectitur,' 2 tom. folio, accompanied by eight plates of inedited coins. In 1786 he published his 'Sylloge 1ma. numorum anecdotorum Thesauri Cæsarei,' 4to.: and his 'Descriptio Numorum Antiochiæ Syriæ, sive Specimen Artis criticæ Numariæ,' 4to., likewise printed at Vienna, the same year: and in 1787 produced a small elementary work on coins for the use of schools, in his native language, entitled 'Kurzgefasste Anfangsgründe zur alten Numismatik,' 8vo., Vien. This work has more recently been improved and published in France, under the title of 'Traité Elémentaire de Numismatique Grecque et Romaine, composé d'après celui d'Eckhel,' par Gerard Jacob, 2 tom. 8vo., Par. 1825. In 1788 Eckhel published a folio volume upon the gems of the Imperial Collection, 'Choix de Pierres gravées du Cabinet Imperial des Antiques, représentées en xl. Planches:' and in 1792 the first volume of his 'Doctrina Numorum Veterum,' Vienna, 4to.; the eighth and last volume of which was published in 1798. A supplement to it, with his portrait prefixed, has since appeared, 'Addenda ad Eckhelii Doctrinam Numorum Veterum ex ejusdem Autographo postumo,' 4to., Vindob., 1826. This work, which embraces the science of numismatics in general, has placed Eckhel at the head of all the writers upon antient coins. He died May 16th, 1798, at the house of his friend the Baron de Locella.

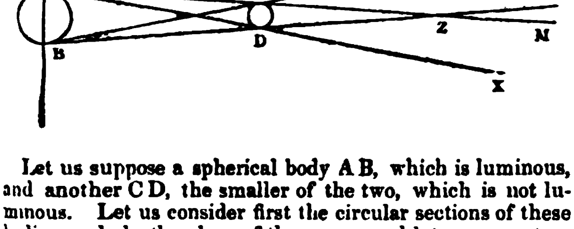
In his younger years Eckhel published three or four small pieces unconnected with numismatics: namely, two Latin odes on the nuptials of Joseph II., in 1765; another in German, in 1768, on the departure of Maria Carolina, archduchess of Austria, from Vienna; and two years afterwards an oration in German on the occasion of the emperor's visit to Italy, 'Rede auf die Reise Josephs II. in Italien,' 8vo., Wien., 1770. An 'Explication grammaticale des Prophéties d'Haggée,' by him, appeared in Millin's Magasin Encyclopédique, IIe année, tom. ii., p. 461.

(Saxii *Onomasticon*; Visconti's account of Eckhel in the *Biographie Universelle*, tom. xii., 8vo., Par. 1814, p. [illegible]-467; and the 'Notitia Literaria de Vitâ et Scriptis J. H. Eckhel, translated from the French of Millin, prefixed to the 'Addenda ad Doctrinam Numorum Veterum.')

ECKMÜHL or EGGMÜHL, a village on the Laber, consisting of about sixteen houses, with a castle, and situated in the Bavarian circle of the Regen, in 48° 47′ N. lat., and 12° 3′ E. long. It owes its celebrity to the signal victory which the French and Bavarians, under the emperor Napoleon, gained over the Austrians, under the archduke Charles, on the 22nd April, 1809. In testimony of the skill and intrepidity which Marshal Davoust displayed on this occasion, Napoleon conferred the title of prince of Eckmühl upon him.

ECLECTICS, the name given to those philosophers who, without adopting any particular system or dogmatizing for themselves, professed to select (ἐκλέγειν) from other philosophical systems whatever they conceived most conformable to truth, and fitted those detached parts together so as to form a new whole. The notion of such a union of jarring systems seems first to have originated with the Neoplatonists, who endeavoured to settle the dispute between themselves and the Peripatetics by the adoption of such parts of the doctrine of Aristotle as could be made to tally with their modification of the academic philosophy. This union of the Aristotelian and Platonic philosophies was attempted first by Potamo of Alexandria, whose principles were taken up and maintained by Ammonius Saccas. It may be doubted however if the title of Eclectics can be properly given to Potamo or Ammonius, the former of whom was in fact merely a Neoplatonist, and the latter rather jumbled together the different systems of Greek philosophy (with the exception of that of Epicurus) than selected the consistent parts of all of them. The most eminent of the followers of Ammonius were Plotinus, Porphyry, Jamblichus, Proclus, and Clemens Alexandrinus; and the antient Eclecticism became at last little more than an attempt to reconcile Platonism with Christianity. The modern and more genuine school of Eclecticism sprung up in the seventeenth century, when Bacon and Descartes flourished. These philosophers refusing to acknowledge themselves members of any particular sect, or to adopt any principle on the mere authority of their predecessors, formed systems for themselves which admitted the doctrines of any other sect without distinction whenever those doctrines were not at variance with what their own investigation had taught them of the nature of things. But modern philosophers have since then formed themselves into new sects, and a new Eclecticism has consequently arisen in our own days, of which the originator was Hegel, and the present supporter Victor Cousin: this newest Eclecticism resembles that of the Alexandrian Platonists in being rather a union of systems than a selection from them, and though it has partisans on the continent, and especially at Berlin, it is not very likely that it will be soon taken up in this country, where persons who read or talk about metaphysics are generally attached to some particular sect of modern philosophy.

ECLIPSE (*ecleipsis*, ἔκλειψις), an astronomical phenomenon, being the disappearance of a heavenly body. This may happen in two distinct ways; either the disappearing body may be lost on account of another body coming between it and its source of light, and thus intercepting the light; or the disappearance of a body may be caused by another body coming between it and the spectator. These two sets of circumstances, though ending in the same species of phenomenon, are yet of a character so different that it will be advisable to consider the two in separate articles. We shall therefore here content ourselves with an enumeration of the various kinds of eclipses; leaving further detail, when necessary, to the articles which will be referred to.



Let us suppose a spherical body A B, which is luminous, and another C D, the smaller of the two, which is not luminous. Let us consider first the circular sections of these bodies made by the plane of the paper, and let common tangents be drawn to these sections, four in number, namely, AX, BY, AM, and BN. If the bodies be very distant from each other, in comparison with their bulk, then it will be sufficient for practical purposes to consider these common tangents as intersecting at A and B, and C and D, the opposite extremities of two parallel diameters. If the whole figure then revolve round the line joining the centre of the two circles, the spherical bodies will be reproduced, together with the conical envelopes by which it may be seen on what the phases of an eclipse depend.

The whole space generated by the revolution of Y C D X is, in whole or in part, deprived of the light from A B. Within the space C D Z (or the cone generated by its revolution), the loss of light is total: a spectator situated within that cone sees no part of A B, and a planet which receives its light from A B cannot, when in that cone, be visible in any part of space. This is even true at the point Z; but anywhere within the cone N Z M, more or less of the border of A B is visible, and C D hides a portion of the middle of A B. If C D be small in comparison with A B, then the effect of C D to a spectator situated far off in N Z M is only the appearance of a small dark spot upon the face of A B.

Within the spaces Y C Z N and M Z D X, a part only of the face of A B is hidden from a spectator there situated, and part only of the light of A B is lost. On the lines C Y or D X the spectator imagines the two bodies AB and CD to be in contact.

The eclipses in which the disappearance takes place by the removal of the light from the body are—

1. The eclipse of the moon. [Moon, Eclipse of.]
2. The disappearance of a portion of Jupiter's surface, occasioned by one of its satellites passing between it and the sun. This is usually called the transit of the satellite's shadow over the disc of Jupiter. [Jupiter.]
3. The eclipses of Jupiter's satellites. [Jupiter.]

The eclipses in which the disappearance arises from the absolute interposition of another planet are—

1. The eclipse of the sun [Sun, Eclipse of], meaning the eclipse of the sun by the moon.
2. The eclipse of the sun (that is, of a very small portion of the sun) by Mercury or by Venus, commonly called the *transit* of Mercury or Venus over the sun's disc. [Mercury, Transit of; Venus, Transit of.]
3. The occultation of a fixed star by the moon. [Moon.]
4. The eclipse of a portion of Jupiter by one of its own satellites, or transit of a satellite over the disc. [Jupiter.]
5. The eclipse of a satellite of Jupiter by Jupiter itself, or occultation of a satellite by the planet. [Jupiter.]

We have here mentioned such eclipses as are not unfrequent: the only additional phenomenon which we are aware of is the eclipse of a portion of the ring of Saturn by a satellite, or passage of a satellite over the ring, seen by Sir W. Herschel. The satellites of Saturn must suffer eclipses of the first kind by entering the shadows either of the planet or the ring, and of the second kind both from the planet and the ring; but these satellites are only seen with very good telescopes and under very favourable circumstances, so that their eclipses excite little public curiosity.

ECLIPTIC. [Equator and Ecliptic.]

ECLOGUE. [Bucolics.]

ECONOMISTES. [Political Economy.]

ECPHIMO'TES (Fitzinger), a genus of Saurians, possessing the teeth and pores of the genus *Polychrus*, but with small scales on the body only. The tail, which is large, has great scales, which are pointed and carinated. The head is covered with plates. The form is a little short and flattened like that of some of the *Agamæ*, rather than like the slender shape of *Polychrus*. Example, *Ecphimotes tuberculatus* (*Agama tuberculata*, Spix; *Tropidurus torquatus*, Pr. Max.)

Description.—Ash-coloured, sprinkled with whitish blotches: a demi-collar of black on each side of the neck.

Locality, Brazil.

ECTOPISTES. [Columbidæ, vol. vii., p. 373.]

ECTOPISTI'NÆ. [Columbidæ, vol. vii., p. 373.]

ECUADOR is one of the three republics, which, before 1831, constituted the republic of Colombia, but since that time has become a separate government. It comprehends the antient kingdom of Quito, with the plains extending east of it between the Amazon river on the south, and the Uaupes, the principal branch of the Rio Negro, on the north. Its boundaries are not marked by natural objects, but follow mostly imaginary lines. A line beginning at Tabatinga, on the Amazon, and running due north, along the meridian of 70° 12′, divides Ecuador from Brazil as far as 1° 10′ N. lat., whence the boundary line runs on this parallel to the Rio Negro. The Rio Negro separates Ecuador from the republic of Venezuela, and the Uaupes forms in the whole length of its course the boundary between it and New Granada. Farther west this line extends over the mountain range in which the Rio Magdalena and the Rio Cauca originate, then passes over the northern ridges of the mountain-knot of Los Pastos, and terminates with the lower course of the Rio de los Patias, on the Pacific. The Pacific forms its western boundary. On the south, Ecuador is separated from Peru by a line beginning near from Almaguer in New Granada over the Páramo de Puruguay (9408 feet above the sea) to Pasto (8578 feet), and hence over the Páramo de Boliche (11,504 feet), and the Alto de Pucara (10,400 feet) to Ibarra (7368 feet) and Quito (9536). In the Alto de Chisinche it attains an elevation of about 10,000 feet. Hence it traverses Hambato (8864 feet), Riobamba Nueva (9472 feet), and Alausi (7984 feet), and attains on the Páramo de Assuay 15,536 feet. In passing this range many lives are annually lost. From Cuença (8640 feet) it runs over the Alto de Pulla (10,000 feet) to Loxa (6768 feet) and hence to Ayavaca (8992 feet) in Peru. From the latter place it proceeds to Truxillo and Lima. Formerly European commodities were imported into Ecuador by this road from New Granada, but since the opening of the trade nearly the whole country receives them from Guayaquil.

Ecuador was discovered by Francis Pizarro in 1526, and came into the hands of the Spaniards at the downfal of the empire of the Incas. The Spaniards remained in the possession of the country up to the year 1812, when the country declared against them. Quito was then a part of the vice-royalty of New Granada, and it participated fully in the frequent vicissitudes of the war, which ended in 1823 with the complete expulsion of the Spaniards. By the convention of Cucuta in 1821, New Granada and Venezuela united and formed one republic under the name of Colombia, but this union lasted only till 1831, when these countries again separated. Ecuador, or the antient kingdom of Quito, was then also separated from New Granada, and since that time has existed as an independent state. While it was united to New Granada and Venezuela the whole republic was under a central government. We do not know whether such a government has been preserved in the new republic of Ecuador, or if it at present consists of a number of smaller states united by a federal government. (Condamine, Ulloa, Humboldt, Caldas in Mollien's *Travels*.)

EDDA. The northern mythology, which in regard to wild imagination and sublime conceptions surpasses that of Greece or Rome, is chiefly contained in two collections called 'The Eddas,' which have been handed down from time immemorial by the scalds, or antient minstrels, of Denmark, Sweden, Norway, and Iceland. The word Edda signifies Mother of Poetry. In the beginning these mythological records were communicated from mouth to mouth, and afterwards written down with the sacred characters of the north, the Runic characters, an alphabet which the Scandinavians are said to have obtained from the seafaring Phœnicians. The Scandinavians initiated in the mysteries of their religion the Saxons, who were forced by Charlemagne to exchange it for Christianity. After the conquest of the Saxons by Charlemagne, the worshippers of the religion of Odin withdrew to Iceland, where the sacred books of the Scandinavians were preserved, from which Samund Sigfudson, a clergyman, and Are Frode, the historian, collected, between the years 1056 and 1133, the older Edda.

This important work was concealed and forgotten for nearly 400 years. However, in the year 1643 a fine copy of these poems was found by Bishop Svensen, and published in 3 vols. 4to., containing the original text, a Latin translation, and a dictionary of the northern mythology. The contents of the poems are prophecies, elevated conversations, and magic songs.

The new Edda, composed or arranged two hundred years later, is a systematic poetical compendium of the former, and is divided into three books; one dogmatical or doctrinal, the second narrative, and the third critical. The Icelandic text of this second Edda was translated in the year 1640, by Resenius, and hence it is called the Resenian Edda.

Some modern critics have endeavoured to question the authenticity of these books, but their objections have been completely refuted by P. C. Müller, Von der Hagen, and the brothers Grimm.

The distinguishing characteristic of the mythology of the Eddas, as compared with that of Greece and Rome, is its systematic or rather epic unity. The mythology of the Greeks and Romans splits into numerous branches, and loses itself in the ocean of real events. That of the Edda, on the contrary, presents in the very beginning the germs of one all-destroying catastrophe, of a creation which by necessity involves the final destruction of the universe. The cosmology itself is truly original. According to the Edda, there was once no heaven above nor earth below, but only a bottomless deep, and a world of mist in which flowed the fountain that strives to devour every thing. Twelve rivers issue from this fountain. When they had flowed so far from their source that the liquid which they contained had become hardened, they ceased to flow, and froze into ice; and one layer of ice accumulating over the other, the great deep was thus filled up.

Southward from the World of Mist was the World of Light. From the former proceeded every thing dark and cold; from the latter whatever is warm and light. The one was the principle of wrath and death; the other, the principle of love and life; a warm wind blowing from the latter upon the ice melted it. The melted drops became animated by the power of him who had sent the wind, and from them sprung Ymir the giant, and the holy Ash [illegible] hill, or the tree of life, which spreads its roots through the deep, and its branches over the universe. Under Ymir's left arm grew a little man and woman, and from them proceeded the ice giants, the heroes, and the gods. This cosmogony is the offspring of a northern view of nature. It is natural that ice should appear to the Scandinavians as dead matter, or as the bad principle, and heat and light, on the contrary, as the creative powers, or good principle. The contrast of these two principles under different symbols, of good and bad genii, heroes, and gods, the alternate ascendancy of the one over the other until the fiery snake consumes universal nature with all-destroying flames, forms the cyclus of the great tragedy—among the incidents of which, the death of Baldur, the beau ideal of Scandinavian heroism, the Achilles of the north, forms one of the most heart-touching episodes. The existence of one supreme ruling principle, and the acknowledgment of a *spiritual* immortal soul in man, are also traceable in different symbols of the Edda. In both Eddas we find also the first rudiments of the great German national epic poem, 'Der Niebelungen Lied.'

Those who wish for further information on this subject may consult *Edda Saemunda hins Froeda*, and Creuzer's *Symbolik*.

EDDOES, the name by which the esculent Caladium is known by the blacks of the Gold Coast. The leaves are boiled and eaten as cabbages with us, but their acridity renders them unsuitable for a European palate.

EDDY is a circular motion of the water, either in rivers or in the sea. It exists more frequently in rivers between the proper current and the counter current. The edges of one current brushing against another give to a small portion of water a circular motion. But an eddy is also produced when the current, running with some violence against a rock or elevated shore, is driven back and meets in the bed of the river or on the opposite shore another obstacle to its course. In this case the eddy generally occupies the greatest part of the bed of the river, and is frequently called a whirlpool. Eddies occur in the sea likewise, where two currents run parallel, but in different directions, as between the Equatorial and North African current. Whirlpools also occur frequently among rocky islands near a coast. [WHIRLPOOL.]

EDDYSTONE or **EDYSTONE LIGHTHOUSE** is constructed on the sloping side of a rock which bears from Plymouth south by west, and from the Ram Head south half a point east. It is distant from the anchorage in the Sound four leagues, and from Ram Head about three leagues and a half, which latter is the nearest shore to the lighthouse. The Isle of Maystone bears from the lighthouse about north-east by north, and is also [illegible] leagues distant. All the rocks near the house are on the east side, stretching to the north and south, and they are all covered at high water; but on the west side any ship may sail close by the house in twelve or thirteen fathoms water, and there are no hidden rocks. Towards the east by north, about a quarter of a mile from the house, there is a rock which never appears but at low spring tides. (Winstanley's *Lighthouse*, book i., cap. 11; Smeaton's *Narrative*.)

The present edifice is a circular tower of stone sweeping up with a gentle curve from the base, and gradually diminishing to the top, somewhat similar to the swelling of the trunk of a tree. The upper extremity is finished with a kind of cornice, and is surmounted with a lantern, having a gallery round it with an iron balustrade. The tower is furnished with a door and windows, and a staircase or ladders for ascending to the lantern, through the apartments for those who keep watch. Mr. Smeaton undertook the arduous task of constructing the present lighthouse in the spring of the year 1759, and completed it in considerably less time than was originally proposed, which was four years. In order to form his foundation, Smeaton accurately measured the very irregular surface of the rock, and made a model of it. (Book ii., chap. 11 of his *Narrative*.)

The materials employed in building the tower are moor-stone, a hard species of granite, and Portland stone. The granite rock was partially worked to form the foundations; and as the ground joint would be more subject to the action of the sea than any other, it was found necessary not only that the bed of every stone should have a level bearing, but that every outside piece should be grafted into the rock, so as to be guarded by a border thereof at least three inches in height above it, which would in reality be equivalent to the founding of the building in a socket of three inches deep in the shallowest part. On the 3rd of August, 1756, Smeaton fixed the centre point of the building and traced out part of the plan on the rock; and on the 6th nearly the whole of the work was set out. (See the plan in the *Narrative* showing the dovetail recesses.) On the 4th of September, the two new steps at the bottom of the rock and the dovetails were roughed out, and some of the beds brought to a level and finished, after very great labour. The stones for the several courses were rough worked at the quarries according to various draughts made by the engineer.

A part of the upper surface of the rock having been taken carefully off, but without the use of gunpowder, lest it should loosen the rock, six foundation courses dovetailed together were then raised on the lower part of the rock, which brought the whole to a solid level mass. These courses, with eight others raised above them, form the solid bed of the work, and take the form of the swelling trunk of a tree at its base. The courses of masonry are dovetailed together in the most skilful manner, and each layer of masonry is strongly cemented together, and connected by oaken trenails or plugs, and the whole strongly cramped. (See the various plans in the *Narrative*.) The general weight of the stones employed is a ton, and some few are two tons. In the solid work the centre stones were fixed first, and all the courses were fitted on a platform and accurately adjusted before they were removed to the rock.

The first lighthouse built on the Eddystone rock was constructed by Mr. Winstanley, a gentleman of Essex, who was a man of a mechanical turn. His work was begun in 1696, and completed in four years. While some repairs were making under his inspection, the building was blown down in a terrible hurricane during the night of the 26th November, 1703, and he and his workmen perished. Not a vestige, except some iron stanchions and a chain, was left behind. It appears from the drawing to have been insufficient for one of its proposed purposes, durability.

It was not till the spring of the year 1706 that an Act was passed for rebuilding the lighthouse, and Mr. Rudyerd, a silk-mercer, was employed by the lessee of the lighthouse to construct a new building. Mr. Rudyerd's want of personal experience was made up by the employment of two of the shipwrights from the royal arsenal at Woolwich.

Mr. Smeaton was of opinion that Rudyerd directed the performance of his work in a masterly manner, and so as perfectly to answer the end for which it was intended, until it was destroyed by fire in 1755. The worm appears, however, to have affected the timbers.

Winstanley's building was constructed principally of wood, and part of the base of stone; Rudyerd's was built entirely of wood, except five courses of moor-stone on the rock. (See the plans in '*A Narrative of the Building, and a Description of the Edystone Lighthouse*,' &c., by John Smeaton, Civil Engineer, F.R.S.)

Mr. Foster's lighthouse, built on the Black Rock, at the mouth of the Mersey, and the Bell Rock lighthouse, off the coast of Fife, are similarly constructed.

The Eddystone lighthouse has not only the merit of utility, but also of beauty, strength, and originality, and is itself sufficient to immortalize the name of the architect. The reader will find every thing curious and interesting connected with this undertaking in Smeaton's splendid folio above referred to.

The base of the tower is about 26 feet 9 inches in diameter, taken at the highest part of the rock. The diameter at the top of the solid masonry is about 19 feet 8 inches, and the height of the solid masonry is 11 feet from the foundation. The masonry may still be considered of solid construction to the top of the stone staircase; the height of the top of which from the centre of the base is 28 feet 4 inches. The height of the tower from the centre is 61 feet 7 inches; the lantern, the base of which is stone, is 24 feet; and the diameter of the tower below the cornice is 15 feet. The whole height is therefore 85 feet 7 inches, according to the scale given by Smeaton to his drawings.

The upper part of the building, constructed of wood, was burnt in 1770, and renewed in 1774.

EDELINCK, GERARD, a distinguished engraver, and likewise eminent as a painter, was born in 1643 at Antwerp, where he acquired the rudiments of his art; but it was in France that his talents were fully developed, and the favours bestowed on him by Louis XIV. induced him to fix his abode in that country. Among his engravings the following are especially worthy of notice:—the Holy Family, after Raphael; Alexander in the Tent of Darius, after Lebrun; the Combat of Cavalry, after Leonardo da Vinci; and, above all, the Crucifixion, after Lebrun. In his larger plates of historical subjects, we too often have reason to lament the choice; many pictures owe all their celebrity to his master-hand. Edelinck was equally happy in his portraits, of which he has left a great number of the most distinguished characters of his age. Several of them are in the collection of eminent men by Perrault. A remarkably pure and brilliant burin, a bold manner, correct drawing, fidelity to nature, and inimitable harmony of execution, place the works of Edelinck in the highest rank among those of his nation. He was engraver to the king, and member of the Royal Academy of Painting, and died at Paris in 1707. Neither his brother John, born 1640, nor his son Nicholas, born at Paris, 1680, equalled him in his art.

EDEN. [CUMBERLAND.]

EDENTATA, Cuvier's sixth order of mammiferous animals, characterized by the absence of teeth in the front of the jaws. Their claws are large, and they are more endowed with strength than agility. Cuvier divides them into three tribes.

1st, the *Tardigrades*. Example, *the Sloths* (*Bradypus*, Linn.) [AI.]

2nd, *the Armadillos* (*Dasypus*, Linn.) [ARMADILLO.] *Chlamyphorus* [CHLAMYPHORUS] comes under this tribe, as well as *Orycteropus* [AARD-VARK], *Myrmecophaga* [ANT-EATER], and *the Pangolins* (*Manis*, Linn.).

The third tribe consists of the Monotremes. [ECHIDNA; ORNITHORHYNCHUS; MONOTREMES.]

Some large extinct fossil animals, the *Megatherium*, for instance, belong to this order.

EDESSA. [ORFA.]

EDFU, a small town of Upper Egypt, on the left bank of the Nile, in 25 N. lat., remarkable for its temple, which is one of the finest and best preserved in Egypt, though much encumbered with sand and rubbish, and with the huts of the inhabitants, who have built their village around and on the top of it. The outward access to the temple is between two enormous propyla, or truncated pyramids, 104 feet long, 37 wide at the base, and 114 feet high. At the summit the horizontal section is 84 feet by 20. On the fronts of these moles immense figures are sculptured in a masterly style. Between the two propyla is the doorway, after passing which we enter a court, 161 feet long and 140 wide, surrounded with walls; on each side of which there is a row of pillars placed at some distance from the side wall, the space between the pillars and the wall being roofed over with stone, forming a covered portico. From the base of the pillars to the top of the stone covering is about 33½ feet. The court is now filled with rubbish, and encumbered with wretched buildings, forming part of the modern village of Edfu, the remainder being built on the roof of the temple itself. From the entrance of the court there is a gradual ascent by a kind of steps to the pronaos or portico of the temple, which is supported by eighteen pillars, six in a row, the whole height of it being about 56 feet above the lowest level of the court. The intercolumniations of the front pillars are built up to more than half the height. Passing through the pronaos, we come to a doorway leading into a kind of hypostyle hall, 66 feet by 33, supported by twelve pillars, with a flat roof formed by large beams of stone crossing from each pillar to the next in the same row, the whole being covered with thick flat slabs. The pillars have the quadrilateral two-headed capital as at Denderah. From this chamber we pass into another long and narrow one, from which there are two small entrances to the side galleries, wherein we see flights of steps leading upwards to the roof of the sekos or cell. Proceeding onwards through the middle chamber, we pass into another small one, with an apartment on each side of it, probably for the use of the priests. From this last-mentioned chamber we enter the holy recess itself, an oblong room about 33 feet by 17, in which the figure of the deity was placed. Two galleries run down on each side of it, leading to a doorway at the back of it, by which the priests might walk into a large but perfectly retired space all round the sanctuary, or might ascend on the roof by a flight of steps to enjoy the air and light on the terraced roof, for below they had no light at all, except it might be from small apertures, through which the Fellahs, who now live on the roof with their families and cattle, discharge all their dirt into the temple. The chambers of the Sekos serve them as repositories for grain and other commodities. It will be observed that from the covered gallery or portico on each side of the outer court there is a path continued all round the temple, between the outer and the inner walls. Probably the vulgar were allowed the use of this walk, as a thick wall was between them and the apartments devoted to the priests and the worship of the deity; for none but the priests, and probably the kings, were admitted into the inner apartments, much less into the adytum or sanctuary, which contained the representation of the deity. The temple, as well as every part of the wall, are covered with hieroglyphics and figures. The outer wall, which joins the two propyla and completely incloses both the court and the temple, is 414 feet on each of its longer sides, and 154 on its shorter side at the back of the temple.

The temple of Edfu may be compared with that of Denderah for preservation, and is superior to it in magnificence. The propylæon is the largest and most perfect of any in Egypt; it contains several apartments in the interior, which receive light by square apertures in the sides. The entrance court is the only one to be seen in Egypt in such perfection, though completely encumbered with Arab huts. The pronaos or portico is magnificent, but unfortunately above three-fourths of it are buried in rubbish. Upon the whole, the temple of Edfu, although built much later than many of the others, being generally attributed to the age of the Ptolemies, is perhaps the most complete specimen remaining of an Egyptian temple, which can give a good idea of the respective proportion and distribution of the different parts of their exterior appearance when entire, and the strength of those formidable citadels, which, while they served as a protection to the town, commanded the respect of the inhabitants, and prevented or defeated any attempts to dispute the authority of their priestly rulers. (See *British Museum, Egyptian Antiquities*, vol. i., in the *Library of Entertaining Knowledge*, with a *ground-plan* of the temple of Edfu; Belzoni; and Wilkinson's *General View of Egypt*.) [EGYPTIAN ARCHITECTURE.]

EDGAR, surnamed the Peaceable, was the second and youngest son of King Edmund I. by his wife Elgiva, or Algiva. He appears to have been born in 943, and consequently was only about three years old at his father's death in 946. His brother Edwy, or Eadwy, may have been a year or perhaps two years older. In these circumstances, Edmund's brother Edred was unanimously chosen to succeed him by the Witenagemote. On the death of Edred, however, in 955, Edwy was placed on the throne; and at the same time his brother Edgar was appointed governor or subregulus of Mercia, which was still considered as a distinct though subject kingdom. When, about two years after his accession, the enmity between Edwy and the church interest broke out into an open quarrel, the people of Mercia and Northumbria, instigated to revolt by Archbishop Odo, or at least timing their movement very opportunely for the purposes of the clerical party, placed Edgar at their head and proclaimed him king. It was finally arranged that Edwy should retain the sovereignty of the territory to the south of the Thames, and that all the rest of the kingdom should be made over to Edgar. The death of Edwy, however, about a year after, made Edgar king of all England (A.D. 959).

The celebrated Dunstan, banished by Edwy, had been recalled by Edgar, and made his chief counsellor, as soon as he found himself established as king of the country to th of the Thames. Being as yet only in his six- ear (or perhaps not quite so old) when he became full king, he was of course entirely in the hands of the monks and clergy, whose instrument he had hitherto been. Dunstan, already bishop both of Worcester and London, was now promoted to the primacy, as well as restored to his abbey of Glastonbury, and became the chief director of affairs both in church and state. The government of the kingdom by Edgar, under the guidance of this ecclesiastic, was unquestionably conducted with remarkable ability and success. Throughout the whole reign England remained undisturbed by war; the northern pirates, who had harassed the country so incessantly for 150 years before, and who, twenty years after the death of Edgar, renewed their attacks, and did not desist until they had effected its conquest, were, during his life, deterred from showing themselves on the English coasts by the powerful naval force that was kept up by this king. The old writers make the fleet of Edgar to have consisted of 3600 ships. 'The number,' says a modern historian, in a somewhat decisive style of narration, 'appears to me enormous: I have therefore retrenched a cipher.' (Lingard, *Hist. Eng.*) In this fleet, which was divided into three squadrons, Edgar is said by Malmsbury to have every Easter circumnavigated the island in person; but this story seems to be merely one of the improbable inventions by which Edgar's monkish admirers have laboured to magnify his name. It may be doubted whether we ought not to regard in the same light what some of the chroniclers tell us about his making annually a progress through the different provinces of his kingdom for the administration of justice. Another work of great public benefit which is attributed to him is the reformation of the coinage. He is also said to have freed Wales from wolves by commuting the money tribute imposed upon the Welsh by his predecessors for a tribute of 300 heads of these animals annually; by which means the wolves were extirpated in four years. But there were wolves in England long after this. Edgar has been chiefly lauded by the monkish annalists for his restoration of the church both to its antient possessions and to a more perfect state of discipline than it had probably ever before known. Under the vigorous administration of Dunstan and his subservient associates Ethelwold and Oswald, the bishops of Winchester and Worcester, the married clergy were at length removed almost to a man from the cathedrals and abbeys; and no fewer than fifty-four monasteries were founded or restored in different parts of the kingdom, and filled with monks as well as richly endowed. They were all subjected to the Benedictine rule.

The laws of Edgar that have been preserved consist partly of some enactments touching the payment of the tithes and other church-dues, and partly of a few civil regulations chiefly relating to the improvement of the police of the kingdom and the better administration of justice. One is directed against the crime of malicious defamation, and enacts that if the falsehood of the evil report can be proved, the defamer should either have his tongue cut out (that it was no doubt thought a peculiarly appropriate punishment), or should redeem it with the value of his head, that is to say, should pay the sum at which his life was valued according to the class of society in which he was ranked. Another directs that the Winchester measure should be the standard for the kingdom. These laws, however, were only enforced in the Saxon provinces of Edgar's dominions. In his Danish subjects, who occupied nearly or fully half the kingdom, he appears to have only recommended the adoption of some of the English laws. The majority of the Danes resident in England were still pagans, and were governed by earls of their own nation, though they acknowledged the supremacy of the Saxon king; and it was not till towards the close of the reign of the Confessor that the authority of the English law was fully extended over that part of the country which they occupied. Edgar however had spent his earliest years among the Danes, and it was by their aid chiefly that he had acquired his first throne: these circumstances at once attached them to him, and gave him great influence over them; and this good understanding appears to have formed a chief part of the strength of his government, and to have very essentially contributed to the preservation of the tranquillity which the kingdom enjoyed during his reign.

The monkish chroniclers give the loftiest descriptions of the power and extensive authority of this king, telling us that he was acknowledged as their supreme lord by all the other kings of Britain and the surrounding islands. The story told in the Saxon chronicle and elsewhere of his having been rowed in his barge on the Dee by the eight subject kings of Scotland, Cumberland, Anglesey with the Isle of Man and the Hebrides, Westmoreland, Galloway, North, South, and Middle Wales, is well known. It is also affirmed that the greater part of Ireland had submitted to his authority. The dominion which he arrogated to himself appears in fact not to have been inferior to what we find claimed for him by his panegyrists. Among the titles assumed by him on his seals and in charters are—'Edgarus Anglorum Basileus, omniumque regum insularum oceani quae Britanniam circumjacent, cunctarumque nationum quae infra eam includuntur, Imperator et Dominus'—'Rex et Primicerius tocius Albionis'—'Basileus dilectae insulae Albionis, subditis nobis sceptris Scottorum, Cumbrorumque, atque Brittonum, et omnium circumcirca regionum,' &c. These 'pompous and boastful titles,' observes Mr. Turner, 'sometimes run to the length of fifteen or eighteen lines.' Much difficulty in believing that this assumption of power had any real foundation is occasioned by the absence of any record or notice of the subjugation of the more important of these neighbouring kingdoms by any of the Anglo-Saxon monarchs. What event ever happened for instance that could possibly have induced the king of Scotland to acknowledge himself in this manner as the vassal of the king of England? The pacific character claimed for the reign of Edgar, who is said never to have had occasion to draw the sword against an enemy, makes it still more difficult to understand how he should thus have compelled all his neighbours to do him homage, and take him for their lord and master.

The monkish writers, with whom Edgar is such a favourite, have not altogether concealed the fact that he was no saint in his morals. Even Lingard seems to admit that one story is tolerably well authenticated, which attributes to him the violation of a lady of noble birth, and that too while she was resident in a convent. Another is told of his having, on one occasion, ordered one of his nobles, whose guest he was, to give him his daughter for a bedfellow, and of the young lady's honour having been saved by her mother substituting for her a handsome slave, with whom the king was so well pleased that, after discovering the deception, he took her to court and retained her for some years as his favourite mistress. He was twice married, first to Elfleda the Fair, by whom he had a son, Edward, who succeeded him; and, secondly, to Elfrida, the daughter of Ordgar, Earl of Devonshire, who bore him Edmund, who died in his infancy, and Ethelred, for whom his infamous mother opened a way to the throne by the murder of Edward. The circumstances of the marriage of Edgar and Elfrida—the commission given by the king to Ethelwold to visit the lady and ascertain the truth of the reports of her beauty—the treachery of Ethelwold, who represented her to his royal master as unworthy of her fame, and then married her himself—the discovery by her and Edgar of the deceit that had been practised on both of them—and the subsequent assassination by the king of his unfaithful emissary—are related by Malmsbury on the faith of an antient ballad. There is nothing in the character either of Elfrida or Edgar that need occasion us any difficulty in believing the story.

Edgar, for some reason which does not clearly appear, was not solemnly crowned till the fourteenth year after he succeeded to the throne. The ceremony was performed at Akemanceastre, that is, Bath, on the 11th of May, 973. He lived only two years longer, dying in 975, when he was succeeded by his eldest son Edward, afterwards designated the Martyr.

EDGAR ATHELING, that is, Edgar of the blood royal, or Prince Edgar, as we should now say. [ATHELING.] The personage commonly understood in English history by this title is Edgar, the grandson of King Edmund Ironside through his son Edward surnamed the Outlaw. Edward and his brother had been sent from England by Canute in 1017, the year after his accession, to his half-brother Olave, king of Sweden, by whom it was probably intended that they should be made away with; but Olave spared the lives of the children, and had them removed to the court of the king of Hungary. All the English historians make the Hungarian king by whom they were received to be Solomon; but this must be a mistake, for that king did not ascend the throne till 1062, and was only born in 1051. The king of Hungary at the time when the children of Edmund Ironside were sent to that country was Stephen I., who reigned from 1001 to 1038. The story, as commonly related, goes on to state that one of the brothers, Edmund (or, as some call him, Edwin), married a daughter of the Hungarian king, but died without issue; and that the other, Edward, married Agatha, the daughter of the Emperor Henry II. and the sister of Queen Sophia, the wife of Solomon. Here again there must be some great mistake; for the Emperor Henry II. never had any children. Who Agatha really was, therefore, it is impossible to say. She bore to her husband, besides Edgar, two daughters, Margaret and Christina.

Edgar, as well as his sisters, must have been born in Hungary; but the year of his birth has not, we believe, been recorded. His father, after an exile of forty years, was sent for to England, in 1057, by his uncle King Edward the Confessor, who professed an intention of acknowledging him as next heir to the crown: the Outlaw accordingly came to this country with his wife and children, but he was never admitted to his uncle's presence, and he died shortly after, not without the suspicion of foul play, which one hypothesis attributes to Earl Harold, another to the duke of Normandy. There is nothing like proof, however, of the guilt of either. The event in the mean time was generally considered as placing young Edgar in the position of his father as heir to the crown; and it seems to have been now that the title of the Atheling (which had been borne by his father) was assumed by or conferred upon him. He was at any rate the Confessor's nearest relation; and if Edmund Ironside, from whom he sprung, was illegitimate, as some have supposed, the circumstance of his having worn the crown seems to have been regarded as sufficient to wipe away the stain, and to bring his descendants into the regular line of the succession. All Edmund's brothers and half-brothers, with the exception of the reigning king, had perished, most of them having been cut off by Canute and the other kings of the Danish stock; and the Confessor himself and his grandnephew, young Edgar, were now the only remaining male descendants of Ethelred II.

Edgar was still in England when the Confessor died in January, 1066; but he was yet very young, and appeared to be feeble in mind as well as in body, and therefore was in nowise fitted either to take a part, or to be used as an instrument by others, in the first tumult of the contest in which two such energetic spirits as Harold and the Norman William now proceeded to try their strength. Insignificant as he was, however, from his personal endowments, the Atheling derived an importance from his descent and his position which afterwards occasioned him to be conspicuously brought forward on various occasions, and has made him an historic character. On the destruction of the power of Harold at the battle of Hastings, he was actually proclaimed king by the citizens of London; but on the approach of the Conqueror, he was one of the first to go to him at Berkhamstead and to offer full submission. He then took up his residence at the court of William, who allowed him to retain the earldom of Oxford, which had been bestowed upon him by Harold. When the Conqueror the following year visited his Norman dominions, we find him taking the Atheling in his train. In 1068, however (the Saxon Chronicle says in 1067, but see a note upon the discrepancy of the authorities as to this and other dates in Lord Hailes's Annals, A.D. 1068), Edgar appears to have fallen into the hands of the discontented Northumbrian lords Maerleswegen (or Marleswine), Cospatric, and others, who, deserting the Norman conqueror, carried the heir of the Saxon line and his mother and sisters with them to the court of the Scottish King Malcolm Canmore. This movement was attended with important consequences. Malcolm soon after married Edgar's eldest sister Margaret, and of this marriage came Matilda, whose union (A.D. 1100) with Henry I. of England was the first step towards the reconcilement of the Saxon and Norman races. Meanwhile Edgar and his friends were followed to Scotland by many other Saxon fugitives, who were the means of introducing into that country much of the superior civilization of the southern part of the island. A connection between Scotland and Hungary appears also to have arisen out of this flight of Edgar and the subsequent marriage of his sister with the Scottish king.

It was not intended however by Cospatric and his associates that Scotland should serve them merely as a place of refuge. A powerful confederacy was immediately formed

against the English king, in which they and their protégé Edgar were associated with the men of Northumberland and Sweyn Estridsen the king of Denmark. The united forces of these several powers stormed the castle of York on the 22nd of October, 1069, and put the Norman garrison to the sword; on which, according to some authorities, Edgar Atheling was a second time actually proclaimed king. But the approach of William soon compelled him to fly for his life, and he again took refuge in Scotland. Here he appears to have remained inactive till the year 1073, when he was again induced to engage in a scheme for annoying the English king at the instigation of Philip king of France, who invited him to come to that country, promising to give him some place of strength from which he might attack either England or Normandy. Edgar on this set out with a few ships; but he was wrecked in a storm on the coast of Northumberland, from which he with difficulty made his escape for the third time to Scotland, in a state of almost complete destitution. He was now advised by his brother-in-law Malcolm to make his peace with William; and that king having received his overtures favourably, he proceeded to England, where William gave him an apartment in his palace, and a daily allowance of a pound of silver for his support. In this state of dependence he remained for some years; but at length he seems to have gone over to Normandy, where, after the death of the Conqueror, his son Duke Robert made the Saxon prince a grant of some lands. The grant, however, for some reason which does not appear, was soon resumed, and the Atheling was compelled, for the fourth time, to betake himself to Scotland in 1091. In the end of the same year it is related that a peace was effected by the good offices of Edgar and Duke Robert between Malcolm and William Rufus, when their armies were met and ready to engage, in *Lothene* or *Loidis* (that is, most probably, the part of Scotland now called Lothian, then considered as a part of England). On this occasion Edgar was reconciled to the English king, and he again took up his abode at the court of William. In January, 1092, however, Duke Robert and he suddenly withdrew together to Normandy; and not long after Malcolm and William were again at war. The Scottish king fell in a conflict with an English force commanded by Robert de Moubray near Alnwick on the 13th November, 1093; his eldest son Edward was slain with him; and his Queen, the sister of Edgar Atheling, died three days after, having only survived to learn the loss of her husband and her son. Immediately after this we read of Edgar securing the children of his deceased brother-in-law and sister from the attempts of their uncle, Donald Bane, who had usurped the Scottish throne, and conveying them to a place of safety in England, a circumstance that would apparently imply that he had himself returned to that country from Normandy, and once more secured the protection of the English king. Here he seems to have remained during the remainder of the reign of Rufus. In 1097 he is recorded to have raised, with the approbation and aid of that king, a body of troops, and marched with them into Scotland, where he drove Donald Bane from the throne, and placed on it his nephew Edgar, the son of Malcolm. One account makes him to have immediately after this joined his old friend Robert duke of Normandy in the Holy Land with a force of 20,000 men, collected from all parts of England and Scotland; but this part of his story is neither well supported, nor very probable in itself. It is certain however that on the breaking out of the war between Henry I. and his brother Robert, a few years after the accession of the former to the English throne, Edgar was found on the side of Robert, although the recent marriage of his sister to Henry might be supposed to have attached him to the interests of that prince. He was one of the prisoners taken by Henry at the decisive battle of Tinchbrai on the 27th of September, 1106, in which Robert finally lost his dukedom and his liberty. The victor however treated the Saxon prince with more lenity or contempt than he showed in his treatment of his own brother. Soon after being brought to England, Edgar was restored to liberty; and some accounts state that he subsequently visited Palestine. But the remainder of his history is very obscure. Malmsbury only informs us, without specifying any date of his decease, that he died in England after having lived to a good old age, without ever having been married or having
ue, leaving behind him the character of a weak
ive and well-intentioned man. He has certainly
ion of being about the most insipid hero of anything like romance on record, and the narrative of his life may be quoted as a curious instance of the interest that may be sometimes awakened by the position and fortunes of an individual however personally insignificant.

EDGE. [ARRIS.]

EDGEHILL. [CHARLES I. OF ENGLAND.]

EDGEWORTH, RICHARD LOVELL, an ingenious mechanical philosopher, but better known as the father and literary associate of Maria Edgeworth, was born at Bath, in 1744. He was descended from an English family, which had settled in Ireland in the reign of queen Elizabeth, and resided at Edgeworth-town, in the county of Longford, where his boyhood was chiefly spent. A hasty marriage, contracted at the age of nineteen, while he was an under-graduate of Corpus College, Oxford, cut short his studies at that university, and led him to return home; but in 1765, intending to be called to the bar, he came to England, and took a house at Hare Hatch, between Maidenhead and Reading. During his visits to London to keep his terms, he became acquainted with Sir Francis Delaval and other gay and sporting men of the day, concerning whom a number of anecdotes are preserved in Mr. Edgeworth's autobiography. In that society he was distinguished by a high flow of spirits and an uncommon share of that activity and ingenuity which adapts itself to the lighter pursuits of social amusement as readily as to higher and more serious purposes. At home he was chiefly occupied in prosecuting a variety of ingenious mechanical contrivances, among which we may mention the first erection of a telegraph in England, originating in a bet relative to the speedy transmission of racing news from Newmarket to London. During this residence in Berkshire he became acquainted with the eccentric philanthropist Thomas Day, with whom he lived in the closest friendship. His mechanical pursuits introduced him to Dr. Darwin, and subsequently to Watt and Bolton, Wedgwood, and other eminent scientific men. In 1769, by his father's death, he came into possession of a handsome, fortune and gave up the intention of following the law as a profession.

Mr. Edgeworth returned to Ireland in 1782, 'with the firm determination,' he says, 'to dedicate the remainder of his life to the improvement of his estate and the education of his children, and with the sincere hope of contributing to the amelioration of the inhabitants of the country from which he drew his subsistence.' To this resolution, during the remaining thirty-five years of his life, he steadily adhered; devoting his best powers to the useful performance of his duties as a magistrate, a landlord, and a father. He was an active and influential member of the Irish Volunteers, and continued, after their dissolution, and through life, a steady advocate of reform in parliament. He was a member of the last Irish house of commons, and spoke and voted in opposition to the Union. Retaining the ardent spirit of his youth, he engaged in a variety of projects for reclaiming bogs, establishing a system of telegraphic communication, experiments on the construction of carriages, moveable railroads, &c. In the cultivation of his estate and in the management of his tenantry he was skilful, prudent, and humane; and in his 'Memoirs' (vol. 2, chap. ii.) may be found an instructive account of the difficulties to be met and the patience requisite in effecting any real improvement in the condition of the Irish peasantry. His judicious and discriminating kindness and his acknowledged impartiality as a magistrate (a rare quality then in Ireland) gained their sincere affection, insomuch that in the insurrection of 1798, though he was absent and assisting with his corps of yeomanry in the defence of Longford, his house at Edgeworth-town was visited by the rebels, and yet was preserved uninjured and untouched. He died June 13, 1817, after an old age of unusual activity and power of enjoyment.

Mr. Edgeworth married four wives, by all of whom he had children. The number of his children, and their unusual difference in age, a difference amounting, between the eldest and youngest, to more than forty years, gave him unusual opportunities of trying experiments in education, and watching their results. His family was brought up almost entirely at home, and with an unusual degree of parental care. The results of his experience were made public in 1798, in 'Practical Education,' a treatise written principally by Miss Edgeworth, but partly by himself; and based on his theory of education, observation, and the experience of his own house. It attracted much attention, and no doubt had considerable effect, in conjunction with the writings of Hannah More and Mrs. Barbauld, in bringing about that improvement in domestic education which has taken place within the last 40 years. Many persons may dissent from some of its views, or some of its principles; but as a repository of valuable suggestions and ingenious expedients, as to children, their habits, tempers, and ways of influencing them, it will always be worthy the attention of parents.

Mr. Edgeworth said he was not a ready writer; and it may have been partly owing to this that he preferred engaging in a sort of literary partnership with his daughter to embarking alone in any work of length. 'Practical Education' and 'Irish Bulls' were avowedly written by them in common; and Miss E. in her father's 'Memoirs' (vol. ii. chap. xvi.) has recorded in warm terms of filial affection her obligations to him in her other works. It was his habit to revise and correct all her productions carefully, and to sanction their issue to the world by his paternal *imprimatur;* a form which the world thought might as well be omitted. But the sterling merits of Mr. Edgeworth's character were amply sufficient to atone for some egotism and vanity.

The following works are published in his name:—'Rational Primer;' 'Poetry Explained;' 'Readings in Poetry;' 'Professional Education;' 'Letter to Lord Charlemont on the Telegraph;' 'Speeches in Parliament;' 'Essay on the Construction of Roads and Carriages.'

He also published papers in the Philosophical Transactions, Nicholson's Journal, and the Transactions of the Royal Irish Academy on various subjects, as the Telegraph, Resistance of the Air, Aerostation, Railroads, the construction of Carriages, and the description of a handsome spire which he had erected *inside* the steeple of the parish church, and then lifted into its place. (*Memoirs of R. E. Edgeworth*, 1820.)

EDICTS, EDICTA, one of the five sources of Roman law enumerated by Gaius (i. § 2). 'The magistrates of the Roman people have authority to make edicts; but the greatest weight is given to the edicts of the two prætors, the Prætor Urbanus and the Prætor Peregrinus. In the provinces the governors (præsides) have the same authority as the prætors (in the city). The authority of the curule ædiles, as to making edicts, is the same as that of the prætors, and in the provinces their powers are possessed by the quæstors.' (On the Edict. Ædil. see *Dig.* xxi. tit. 1; *Cod.* iv. tit. 58.)

It was the custom of the prætors on their accession to office to publish edicts, which were rules adapted to regulate the practice of their courts, similar to the Orders promulgated by the English chancellors. This power of legislating having been abused, it was enacted by the Cornelian law B.C. 67, that when a prætor, on his accession to office, had published any edict or general rule, he should be bound to keep to it during the whole year of his office. A prætor was not bound by the edicts of his predecessor: if he confirmed them, the edicts were called Vetera et Tralatitia; if he made new edicts, they were called Nova. On an occasion mentioned by Cicero (*De Offic.* iii., 20) the prætors and tribunes of the Plebs united in drawing up an edict relative to the coinage. This instance will serve as an example of the extent to which the prætors under the Republic exercised legislative power. Instead of confining themselves to rules for the regulation of the practice of the courts they gradually assumed the power of repealing written law and making new laws, on the ground of correcting the error of the written laws whenever they seemed inapplicable from generality or other defect. (See the various titles of the *Digest.* lib. xxxvii.) From the decisions of the prætors arose a large body of law, which was known by the name of Jus Honorarium or Prætorium (Papinian. *Dig.* i., tit. 1. 7.), as distinguished from the Jus Civile, and may, to a certain extent, be considered as corresponding to the equity of the English Court of Chancery.

Under the early emperors the magistrates published edicts, but Hadrian commissioned Salvius Julianus (A.D. 132) to make a digest of all the best decisions, which were collected in a small volume called the Edictum Perpetuum, and ratified by a Senatus Consultum. From that time the power of making edicts was taken from the magistrates, and the legislative power was vested in the emperors. (*Cod.* i., tit. 17.) [CONSTITUTIONS, ROMAN.]

EDINBURGH COUNTY, or MID-LOTHIAN, is bounded on the north by the Frith of Forth; on the south by the counties of Selkirk, Peebles, and Lanark; on the east by Haddington, Berwick, and Roxburgh; and on the west by Linlithgow: comprehending an area of 354 square miles, or 226,560 English statute acres. The surface is in general uneven. The most hilly district is the south-eastern part, which is traversed by the Heriot and Galla Waters. In the high ground which divides this district from that traversed by the rivers falling into the Frith of Forth, is the Sayrs Law, 1739 feet above the sea. The western continuation of this high ground forms the boundary between Edinburgh on the north, and Peebles and Lanark on the south, and perhaps attains a general elevation of 800 or 1000 feet above the sea. It is for the most part rather flat, and covered with bogs and mosses; but in some parts there are hills of considerable elevation, as, near the sources of Muirfoot Water, the Coat Law (1680 feet), and the Blackhope Scares (1850 feet). Between the origin of the North Esk and the Leith Water are several high hills, as the Cairn Hill (1800 feet), and others which belong to the Pentland Hills. Farther west only isolated hills occur, the highest of which, Leven's Seat, at the western extremity of the county, is about 1200 feet above the sea.

Of the country extending between this high ground and the Frith of Forth, only the middle district between the North Esk and Leith Water is very hilly. Here are the Pentland Hills, the highest summits of which are from 1800 to 1900 feet above the sea, but their mean elevation probably does not exceed 1000 or 1200 feet. They terminate to the south of Libberton and to the west of Laswade. The country on both sides of this district is less hilly; the heights neither attain such an elevation, as in the part just described, nor do they terminate with steep declivities, except along the banks of some of the rivers. A line drawn from Dalkeith through Libberton, Collington, and Currie to Rath marks the northern boundary of the more hilly part of the country. North of this line the country presents an undulating surface, on which a few hills rise to a moderate elevation. Such is Arthur's Seat, near Edinburgh, 822 feet above the sea, and farther west the Corstorphine Hills, which extend two miles in length and rise to 470 feet. The principal rivers are the Galla Water, which falls into the Tweed; and the South and North Esk, which unite below Dalkeith; the Water of Leith; and the Almond Water, which separates this county from that of Linlithgow. These rivers fall into the Frith of Forth.

It is said that at Dalkeith, on an average of eight years, the annual fall of rain was $22\frac{6}{10}$ inches. Dr. Brewster states the mean annual temperature at Leith to be 48° 36′. At Edinburgh, which is elevated from 300 to 400 feet above the level of the sea, and situated about two miles from it, the mean annual temperature is 47° 8′. This may be taken as a near approximation to that of the more inland parts of the south of Scotland.

Part of an important mineral district, the great coal-field of Scotland, is within this county. The county also contains considerable beds of limestone and freestone. The former are principally about Dalkeith. The principal freestone quarries are at Craigleith, Hales, and Redkall. Clay soil predominates in the county, and there are few parts remarkable for natural fertility. Two-thirds of the land, however, is now under cultivation, of which from 15,000 to 18,000 acres are employed to raise wheat. There is a considerable number of large estates in the county, but on the whole property is much divided.

The county is in various ways affected by the circumstance of its containing within it the capital of the kingdom. This circumstance evidently modifies the productions and uses of the soil. To this also we owe the excellent state of the public roads in the county, the railways, and the Union canal, though this last has hitherto proved a most unprofitable speculation to the proprietors.

The population of the county has stood as follows:—

Year.	Persons.	Families.
1755	90,412	
1801	122,954	
1811	148,607	
1821	191,514	
1831	219,345	47,415

Mid-Lothian returns four members to parliament—one for the county of Edinburgh, two for the city, and one for the burghs of Leith, Musselburgh, &c.

EDINBURGH CITY, the chief town of Edinburghshire, or Mid-Lothian, and the capital of Scotland, is situated in 55° 57′ 20″ N. lat., and 3° 10′ 30″ W. long., about 392 miles north from London. It stands upon a group of hills separated by deep depressions, and is at once the site and the scene of views of great beauty and grandeur. On the highest of the hills the Old Town is built; the summit of the hill forms a street upwards of a mile long, ascending in nearly a straight line from the palace of Holyrood on the east, about 120 feet above the level of the sea to the Castle, which is elevated upwards of 380 feet above the same level, and is accessible only on the eastern side, all the others being nearly perpendicular. The view from this height is singularly varied and grand; the spectator is in the midst of an amphitheatre of hills. On the east are the Calton Hill, Salisbury Craigs, and Arthur's Seat, rising 822 feet above the level of the sea; and on the west are the Pentland range, and the woody eminence of Corstorphine. Below, on the north, are the noble mansions of the New Town, the Frith of Forth, with its ports and shipping, and the counties on the opposite coasts to the Highland hills; a landscape forming a beautiful contrast with the rich open country which spreads before us on the south to the hills of Berwickshire and the borders, till at length the eye rests upon the Braid Hills.

Edinburgh is supposed to have derived its name from Edwin, a king of Northumberland in the time of the Heptarchy. Simeon of Durham mentions the town of *Edwinesburch* as existing in the middle of the eighth century; and in the charter of foundation of the abbey of Holyrood, in the year 1128, King David I. calls it *his burgh of Edwinesburg*, whence we infer it was then a royal burgh. The historians of Edinburgh say that the first parliament held in the city was on the accession of King Alexander II.; but upwards of half a century previous, we find a 'concordia,' or agreement, entered into between the bishop of St. Andrews and the abbot of Dunfermline, *apud Castellum Puellarum* (a name long bestowed on Edinburgh Castle), in presence of the king, Prince Henry his son, and their barons (Connell *On Tithes*, App. No. 1), which we apprehend was no other than an assembly of the great council of the nation. The castle was then perhaps the chief building and place of concourse in the city; and in the reign of King Malcolm IV., Geoffrey de Maleville, of Maleville Castle, in the shire of Edinburgh, was *vicecomes de Castrum Puellarum*, meaning thereby, no doubt, sheriff of the shire, in like manner as Macbeth, the earliest sheriff in the shire of Perth, was styled sheriff of Scone. The abbey of Holyrood, however, was growing into importance. In 1177 a national council was held there on the arrival of the legate Vivian, to determine the dispute between the English and Scottish clergy; and it is not unlikely that its neighbourhood early became a royal residence.

The city appears to have remained open and defenceless till about the middle of the fifteenth century, when, on the representations of the provost and community, King James II. granted the citizens 'full license and leiff to fosse, bulwark, wall, tour, turate, and other ways to strength the burgh, in quhat maner of wise or degree that beis sene maist spedeful to thaim.' The same king soon afterwards granted a charter to the city confirming to it the privilege of holding therein the antient and important court of Four Boroughs, 'sicut à temporibus retroactis tenebatur.' His successor, grateful for the interest which the citizens had shown in his behalf when he was at variance with his nobles, erected the city into a sheriffdom within itself, and presented to the incorporated trades a banner or standard, which has since been known by the name of the Blue Blanket, and is still preserved. King James IV. patronized the erection of its first printing-press; and in the succeeding reign it became the undisputed capital of the kingdom; the seat of the royal palace, of the parliament, and of the superior courts of justice.

The accession of King James VI. to the throne of England put a temporary stop to the progress of the town; but at the Union the spirit of improvement revived, and has continued to our own day.

Edinburgh is divided into three principal parts: the Old Town, the South Side, or Southern Districts, and the New Town; each of which has its own peculiar features and character. The Old Town is intersected by the street previously mentioned: on each side descend in regular lines a multitude of narrow wynds, closes, and styles, which on the south lead for the most part into the Cowgate, a confined street running along the southern base of the hill, and one of the earliest additions to the town after the erection of the city-wall in the middle of the fifteenth century. Over this street the South Bridge, and more lately King George the Fourth's Bridge, are thrown, to connect the Old Town with the South Side or Southern Districts. These districts mostly stand upon a rising ground, which is here closely adjacent to the Old Town ridge, but neither so elevated, so limited in extent, nor so steep in its descent, as that hill. From its western side, however, there runs a hill of a different character, and thence called the High Riggs. It is separated from the Castle-hill by a [illegible] street called the Grass Market, and on it are built Heriot's Hospital and the neighbouring suburb of Portsburgh. In a line with the South Bridge is the North Bridge, thrown from the summit of the Old Town ridge, at the middle of the High-street, to the rising ground which forms the [illegible] of the New Town. This ground partakes much of the character of the Old Town ridge, and terminates like it in a bold rock, namely the Calton Hill; but the aspect of the houses is wholly different: for having been erected according to regular plans conceived in a spirit of improvement, the greatest regularity and beauty characterise the buildings, streets, and squares. From the earth and rubbish thrown from the foundation of the New Town buildings, the Earthen Mound was formed as a communication across the morass which lies between the Old and New Town.

Among the chief buildings of the city is the Castle, which is the most antient part of the city, and must have been of considerable importance in former times. It is now, however, a place of little strength, and derives its interest chiefly from the associations connected with it and its own formidable appearance. At no great distance from the Castle stands the Parliament House, with the courts of justice. In the first of these the parliament of Scotland met between the time of its erection in 1640 and the Union. The hall now forms the Outer House of the Court of Session, and in its immediate neighbourhood are rooms appropriated to the Inner House and to the courts of Justiciary and Exchequer. The valuable library of the faculty of advocates occupied till lately the ground-floor of the Parliament House. A considerable part still remains there; but adjacent buildings have been erected not only for it, but also for the library of the writers to the signet. The courts of the sheriff and justices of the peace are held in the county hall, an elegant building of recent erection, close by the range of building which contains the library of the writers to the signet. The antient Gothic fabric, formerly the cathedral of St. Giles, is also in this neighbourhood; from between the arches which constitute the imperial crown that rests upon its lofty tower, there is an interesting view of the city and surrounding country. On the opposite side of the street is the Royal Exchange, which contains the common council-room and other offices of the magistracy; and in the centre of the street, a little way down, is a radiated causeway to mark the site of the old market-cross, where proclamations used to be made and offenders punished. At the foot of the High Street stands one of the oldest stone houses in Edinburgh, the house of the great Scottish reformer, John Knox; and on the front wall, to the west, is a figure in alto rilievo pointing to a radiated stone, whereon is sculptured the name of the Deity in Greek, Latin, and English. Below this is the Canongate, at the foot of which are the palace and abbey of Holyrood, whose extensive precincts constitute a sanctuary for insolvent debtors. On the summit of the Calton Hill, which rises in the immediate neighbourhood, and commands a delightful prospect of the Forth and surrounding scenery, some columns of the National Monument have been erected, and stand in solitary grandeur. Near them are the observatory and the monuments to Dugald Stewart and Playfair. On the low ground, towards the west, are the bridewell and gaol; and in the same line, at a point nearly equidistant from the palace and castle, stands the Register House, where the public records of the kingdom are preserved, and what is almost peculiar to this part of the empire, the [illegible] of all deeds conveying or charging territorial property.

The city churches are properly 13 in number, of which the most deserving of notice are St. Giles's, St. George's, St. Andrew's, St. Stephen's, and St. Mary's; to these are to be added St. Cuthbert's or West Kirk, Canongate Church, and various chapels belonging to the establishment. The elegant Gothic edifices, St. Paul's, St. Giles's, and St. George's chapels, belonging to the episcopal communion, are also deserving of attention, and the Roman

Catholic chapel at the head of Leith Walk. The Roman Catholics have another chapel in the town, and at the head of Bruntisfield Links, a convent of nuns, attached to which is an establishment at Milton House, in the Canongate.

Edinburgh has some noble hospitals and charitable institutions. Among these are the Royal Infirmary, erected on a rising ground in the neighbourhood of the college; Heriot's Hospital, already mentioned; Watson's Hospitals, Merchant-Maiden and Trades'-Maiden Hospitals, Orphan Hospital, and Gillespie's Hospital; Institution for the Deaf and Dumb, Asylum for the Blind, Magdalen Asylum, and Lunatic Asylum. Most of the banking-houses of Edinburgh are large edifices: such, in particular, are the Bank of Scotland, the Royal Bank, and the Commercial Bank.

The public amusements of Edinburgh are limited, and do not, generally speaking, succeed. The habits of the people are domestic; and the professional and literary, not less than the religious character which prevails, does not accord with the occupations of the theatre and assembly-rooms. Printing, shawl-making, and coach-building, are carried on with much success; but the manufactures of Edinburgh are of no great importance. The city however is well situated both for water and fuel, which might be made available for manufactures. They have been of essential consequence to the comfort of the inhabitants; and notwithstanding the variable climate, there are few, if any, diseases to which the residents of Edinburgh can be said to be peculiarly liable. The situation of the place is favourable to health and energy, and the mortality, it is believed, is small in proportion to the population. The city returns two members to parliament.

Until a comparatively recent period, Edinburgh was a place of very limited extent. The contiguous country, which has now been made to form a part of the capital, comprehends various places antiently subject to different jurisdictions, and which have as yet continued municipally disunited, except for the purpose of returning members to parliament under the recent Reform Act. Besides various districts subject only to the jurisdiction of the county sheriff, the boundaries fixed by the Reform Act include within their limits—

1. The Royalty of Edinburgh. 2. The Burgh of Regality of Canongate. 3. The Burgh of Barony of Portsburgh, Easter and Wester. 4. Calton.

The existence of Edinburgh as a king's burgh may be traced to the reign of David I., and before the middle of the twelfth century. At a very early period it was one of those burghs royal whose magistrates constituted the Court of Four Burghs; and by a charter dated in 1452 king James II. conferred on it the privilege of being exclusively the seat of that court: the other three burghs were Stirling, Linlithgow, and Lanark. In 1482 the valuable right of sheriffship within the bounds of the burgh was given by James III., and this jurisdiction was confirmed by succeeding monarchs. A general charter of confirmation was granted to Edinburgh by James VI. in 1603; and another charter, known under the name of Novo Damus, was the gift of Charles I. in 1636. These charters specify Leith and Newhaven as belonging to the burgh, and detail the markets, tolls, and customs, which constitute 'a part of the common good,' for the protection of which a comprehensive jurisdiction is conferred. Other grants and charters were afterwards obtained at different times from the crown, prior to the Union in 1707; but not any of these created any substantial change in the political or municipal constitution of the burgh. Since the Union, and more particularly within the last fifty years, various acts of parliament have been passed for extending the bounds of the royalty, and for purposes of police. By a charter of George III. in 1794, the provost, who by previous charters was sheriff and coroner, was constituted lord-lieutenant of the county of the city.

Previous to the late Scotch Burgh Reform Act, Edinburgh was governed by a close corporation, the members of which constantly re-elected each other; but by that act (3 and 4 Will. IV., c. 76), the right of election to corporate offices was declared to be in all those persons who are entitled to vote for members of parliament.

The government of the city of Edinburgh is vested in the magistracy and town council. The magistracy consists of a lord provost, a dean of guild, a treasurer, and four baillies, each of whom is *ex officio* a member of the council. The council consists of seventeen merchants, six deacons, and two trades' councillors, in all twenty-five; the six deacons are selected from among fourteen who are elected by the citizens; the remaining eight, who are called extra deacons, are not called councillors, but have a vote in the council in all cases where the money in question exceeds 1*l*. 13*s*. 4*d*. (20*l*. Scots). For the purposes of the election the city is divided into wards or districts. One-third part of the councillors go out of office every year, but are eligible for re-election. The provost, baillies, treasurer, and other office-bearers, are elected by the councillors. The provost's term of office is three years, and he is eligible for immediate re-election. The other office-bearers go out at the expiration of one year, and cannot be re-elected until each shall have been out of his particular office one year; but this does not prevent their being kept in the council from year to year by their being elected to fill the different offices in succession.

None but burgesses or freemen of the burgh are entitled to carry on trade or manufactures within the bounds. There are eight incorporated crafts within the burgh, all enjoying exclusive privileges and possessed of funds which are appropriated to the support of decayed members or the widows of such as are deceased. These crafts are hammermen, tailors, wrights, bakers, shoemakers, weavers, fleshers, and barbers: the number of burgesses has not been ascertained, but is estimated to amount to about 400. The magistrates grant temporary licenses to trade to persons not freemen, and charge for such licenses from 5*s*. to 10*s*. per annum.

From an early period the property of the burgh has been administered very improvidently. In 1658 the debt of the city was stated to amount to 54,761*l*. sterling, and in 1692 had increased to 64,250*l*. In 1819, when the affairs of Edinburgh were examined by a Committee of the House of Commons, the actual debts of the city were stated to amount to 497,101*l*. including 264,258*l*. incurred on account of the Leith docks; and in 1833 a statement was drawn up under the authority of the magistrates and council which gave the amount of ordinary debts and obligations of the city at 425,194*l*., in which amount the engagements on account of the Leith docks are not included. The revenue of the city, as stated under the same authority, amounted then to 27,524*l*., and its annual current expenditure to upwards of 33,000*l*. Under these circumstances, the city was declared insolvent, and an act was passed in August, 1833, conveying its whole properties and revenues to trustees for the general benefit, whereby they were preserved from the legal attacks of individual creditors. Some circumstances connected with the accounts of the city have been published, which have subjected the members of its government to much censure. Among these circumstances, it may be stated that the late Dr. Bell having bequeathed a considerable fund for the purposes of education, a sum of 10,000*l*. 3 per cent. stock was placed in the hands of the magistrates and council in trust to apply the dividends to the support of a school or schools in Edinburgh on the principles of the Madras system. Being pressed by a clamorous creditor for the payment of his claim, this stock was sold, and the greater part of the proceeds appropriated 'to prevent a blow-up in the city's affairs, and to enable them to continue the existing system a little longer.'

The population of the city of Edinburgh and the suburbs, which together constitute the capital, were at each census of the present century as follows:—

	1801.	1811.	1821	1831.
Parishes in the city	20,658	22,578	29,850	40,315
" the suburbs, including Canongate and St. Cuthbert's	45,886	59,206	82,385	95,379
" North and South Leith	15,272	20,363	26,000	25,855
	81,816	102,147	138,235	161,909
The population of the Shire of Edinburgh at these four periods, including the capital, was	122,954	148,607	191,514	219,345

The further particulars obtained at the census of 1831 exhibit the following results:—

	Edinburgh city.	Remainder of county.	Total.
Houses inhabited	10,179	9,565	19,744
" building	95	55	150
" uninhabited	582	527	1,109
Families	35,116	12,299	47,415
" employed chiefly in agriculture	563	3,076	3,639
" " in trade, manufactures, &c.	17,190	3,864	21,054
" all not comprised in the two preceding classes	17,363	5,359	22,722
Males	72,299	27,504	99,803
Females	89,610	29,932	119,542
Males 20 years of age and upwards	36,667	13,415	50,082
Female servants	12,429	3,045	15,474

Edinburgh contains the supreme courts of justice for

Scotland, and is the residence of the principal practitioners of the legal profession; it is also the chief school of medicine and other sciences in Scotland. In the strict sense of the word, only a small part of the population, as already observed, can be said to be engaged in manufactures; the number of males 20 years of age stated to be so engaged in 1831 was 792; a great part of these were employed in making shawls, and the rest in weaving hair-cloth and silk, net-weaving, lace-making, and other small wares. The trade of Edinburgh is carried on through its port, Leith, under which head it will be described. [LEITH.] The amount of postage collected in Edinburgh during the last five years was as follows:—

1832 . .	£42,759
1833 . .	41,864
1834 . .	41,680
1835 . .	41,959
1836 . .	43,520

The University of Edinburgh consists of the College of King James, founded by James VI. of Scotland, by a charter dated 24th April, 1582. By this charter, which still forms the only constitution of the university, the provost, bailies, and town councillors of Edinburgh, and their successors in office, were invested with the sole power both of electing the professors and of dismissing them. In virtue of this authorization, indeed, the town council, or corporation of the burgh, has ever since assumed nearly the entire direction and control of the university—electing the professors, founding new chairs, managing the funds, and even regulating the class fees and the discipline of the institution. The Senatus Academicus, or body of professors, if such a body has any legal existence (for no senate or other academical court or council is constituted by the charter), is understood not to have the right of interfering in any of these matters, although it may sometimes have passed regulations of discipline which the town council has not thought proper to disturb. Indeed the supremacy of the town council, even in regard to making regulations as to the course of study for degrees, when it was a few years ago resisted by the professors, was affirmed in the most ample terms by a judgment of the Court of Session. Some years ago the clergy of the city put forward their claim to a voice in the election of professors, on the ground of a direction in the charter that the right of appointment given to the town council should be exercised *cum avisamento ministrorum*. The claim was keenly agitated in pamphlets and in the church courts, and some steps were taken to enforce it; but on application being made to the Court of Session in the case of a particular election, the court refused to grant an interdict, and the question was dropped. The only interference with their sole right of control that has been submitted to by the town council are the following. In modern times, about eight or nine new professorships have been founded by the crown, of which it has retained the patronage; but against the exercise of this power a protest is regularly taken by the town council that it shall not hurt or prejudge their rights. In the case of a few other chairs there has always been an interference with the nomination of the professor on the part of certain public bodies. For the most part this has been grounded on the contribution by the said bodies of part of the professor's salary; but in one instance at least no such reason for the practice can, we believe, be alleged, in that, namely, of the professorship of Humanity, or Latin, which is besides one of the oldest chairs. The professor of Humanity is thus elected according to the late Report of the Commissioners appointed by the crown for inquiring into the state of the Universities and Colleges of Scotland: 'The Lords of Session name two delegates, the town council name one, the Faculty of Advocates one, and the Society of Writers to the Signet one. They meet together and appoint the professor. They then lay their minute of election before the town council, who issue a commission, in their own name, proceeding on the narrative of the election of the delegates, and binding the professor to obey laws and regulations, the same as if he were appointed solely by themselves.' (p. 117). Many visitations of the university have also taken place under the authority of the crown, of parliament, and even of the general assembly; but what legal force may belong to any regulations that may have been laid down by the visitors does not clearly appear. In this non-recognition of any authority, or at least of any independent and supreme authority, as belonging to either the entire body of the professors and students, or even to the Senatus Academicus, or council of the professors only, the University of Edinburgh differs from all the other Scottish colleges. 'The Senatus Academicus,' says the Report of the Commissioners, 'acknowledge no authority but their own for instituting new faculties, and for fixing the privileges and immunities belonging to them.' But what privileges they can confer, or ever have conferred, is not stated. The Senatus does not appear to have ever been recognised by the town council as anything more than a mere meeting of the professors. Until of late years it is not recollected that there ever had been a vote in it (*Report*, p. 115), and it would still probably be impossible to quote any resolution it has passed which has been operative in any quarter except where it was voluntarily acquiesced in.

One of the consequences of this non-incorporation of the university in any form has been, that it is without certain public officers which are found in all the other universities. There is no mention in the charter of a Chancellor; and although in early times the name was occasionally taken by the provost of the city, this must be regarded as having been quite an unauthorized assumption, and the office does not now exist at all, and has not existed for a long period. The case with regard to the office of Rector is nearly the same. 'This important office,' say the Commissioners, 'has been much less efficient in Edinburgh than in the other universities. * * * The existence of the office itself has often been, apparently at least, suspended.' They afterwards state that it was held by several persons, though with frequent intervals, during the greater part of a century from the foundation of the university; but from the beginning of the eighteenth century, they conclude, 'till within these few years the office was never heard of in the university, much less known as an office attended with the performance of any duties. It is accordingly explicitly asserted, that no chancellor or vice-chancellor, rector, or dean of faculty, exercises any authority or jurisdiction over the principal, professors, or students in the University of Edinburgh.'—(pp. 114, 115.)

The charter of king James in fact merely gave power to the town council to build houses for professors of certain departments of science and learning, and to engage persons to act as such. Proceeding upon this authority, the provost and magistrates of Edinburgh on the 14th September, 1583, entered into a contract with Mr. Robert Pollock, one of the professors or regents of the university of St. Andrews, to exercise the same office of regent in the new seminary. He was engaged at first only for a year, and at a salary of no more than 40*l*. Scots, that is, between 3*l*. and 4*l*. sterling, in addition to the fees to be paid by the students. In [illegible] the king executed a new deed in relation to the university, conferring certain property for its support on the magistrates and council. The following year the council constituted Pollock Principal master of the college. At this time, or soon after, there are said to have been four other regents engaged in teaching. A second charter, ratifying what had been already done, was granted by the king in 1612; and in 1621 an act of the Scottish parliament was passed, confirming certain grants of property which had been made to the town of Edinburgh for the support of the institution. The preamble states, that the college, which is described as 'for profession of Theology, Philosophy, and Humanity,' had greatly flourished during the thirty [illegible] years it had been in existence. It was by this charter that the name of King James's College was conferred upon it.

The system of teaching originally pursued was the same as at the other Scotch universities. The Principal was regarded as Professor of Divinity, and his prelections were confined to that department. But each of the other four regents carried his students, during the four years they remained under his care, over the entire curriculum of literature and philosophy. In 1620 a second Professor of Theology was appointed, and then the Principal ceased to teach that science, though down to the year 1765 he used to deliver one course in each session. Since the cessation of this practice in the time of Dr. Robertson the historian, the office has been a mere sinecure. A commission of visitation, appointed by parliament in 1690, directed that each professor should for the future be confined to one particular department; but this important alteration was not carried into effect till about the year 1708. The old practice was continued in Mareschal College, Aberdeen, down to the year 1753, and in King's College until 1800.

Minute details on the subject of the property belonging to the university, are given in the Report of the Commissioners, pp. 105-113. It is derived from a variety of sources, but is altogether of inconsiderable amount. The management of it is wholly in the hands of the town council, which is in the habit of supplying the difference between the income and expenditure of the college from the funds of the city. In 1824 the total college revenue amounted only to 907l., while the expenditure was 2223l. And in addition to the last-mentioned sum, there were paid to different professors by royal grants the sum of 1435l.; by royal grant for the support of the museum 100l.; to the Professor of Agriculture 50l., from funds provided by the late Sir William Pulteney, the founder of the chair; and to the professor of Conveyancing 120l. from the Society of Writers to the Signet. From the year 1776, also, to the year 1828 inclusive, it appears that 8192l. had been granted by the crown for defraying the expenses of the Botanical Garden.

A bequest which is described as of large amount has been left to the administration of the Principal and professors by the will of the late General Reid, dated in 1806, for founding a professorship of music and making additions to the library, or otherwise promoting the general interest and advantage of the university; but we are not aware that it has yet become available, the income arising from the funds having been left to the testator's daughter during her life. A valuable collection of pictures and marbles was bequeathed for the use of the university by the late Sir James Erskine, of Torry, bart.

The bursaries or exhibitions attached to the university are eighty in number, of which three are of the annual value of 100l. each; six of 30l.; ten of 20l.; five between 20l. and 15l.; eleven between 15l. and 10l.; forty-two between 10l. and 5l.; and three under 5l.

The foundation of a university library was laid about the time that the seminary was opened, by the transference to it by the town-council of a library of about 300 volumes, chiefly theological, which had been bequeathed in 1580 "to Edinburgh and the kirk of God" by one of the citizens, Mr Clement Little, commissary. The collection was augmented in early times by various donations, among which was one of his whole library, consisting of about 500 volumes, by the poet Drummond of Hawthornden. No catalogue of the university library has ever been printed, although one has been lately completed in manuscript. The entire number of volumes is now not much under 100,000. The annual pecuniary income of the library is stated, in the Report of the Commissioners, at about 1150l., derived chiefly from fees paid on matriculation and graduation. Besides the public library, there is a theological library for the use of the students of theology, founded by Dr George Campbell, professor of theology, about the end of the seventeenth century. It now consists of above 3000 volumes. An observatory, a museum of natural history, an anatomical museum, and a botanical garden also belong to the university.

The buildings of the university consist of a single quadrangle, which is not yet entirely completed, on a scale reduced from the original design by the late Mr Robert Adam, although it was begun so long ago as in the year 1789. The funds were at first contributed by subscription, but at length an annual grant of 10,000l. was obtained from parliament. The fabric, upon which a very large amount in all has been expended, is one of considerable magnificence. It was originally designed to contain houses for the professors, as well as the library, museums, and class-rooms; but only one official house has been built, which is occupied by the principal librarian.

The progressive increase of the establishment of the university and the particulars of its present state will be most conveniently exhibited in the following table, compiled from the Report of the late commissioners:

Offices	Dates of Foundation.	Patrons.	Salaries.			Class Fees.			No. of Students.
			£.	s.	d.	£.	s.	d.	
Principal	1586	Town Council	121	2	2	None			None
Professor of Humanity	1597	Town Council, &c. (see ante)	67	4	4	1979	17	0	319
" Divinity	1620	Town Council	196	2	2	400	0	0?	296
" Oriental Languages	1642	Ditto	115	6	0	149	16	0	68
" Mathematics	1674	Ditto	146	5	0	618	9	0	175
" Botany	1676	Town Council and Crown	127	15	6	808	10	0	213
" Theory of Physic	1685	Town Council	None			862	0	0	210
" Practice of Physic	1685	Ditto	None			1028	0	0	240
" Ecclesiastical History	1695	Crown	260	0	0	280	0	0?	123
" Anatomy and Surgery	1705	Town Council	50	0	0	969	3	0	237
" Public Law	1707	Crown	484	0	0	None			None
" Greek	1708	Town Council	67	4	5	1175	18	0	372
" Natural Philosophy	1708	Ditto	62	4	4	619	6	0	152
" Moral Philosophy	1708	Ditto	102	4	4	536	10	0	150
" Logic	1708	Ditto	52	4	4	531	4	0	173
" Civil Law	1710	Ditto and Faculty of Advocates	100	0	0	151	4	6	56
" Chemistry	1713	Town Council	None			2212	8	0	537
" Universal History	1719	Ditto and Faculty of Advocates	100	0	0	105	0	0	25
" Scotch Law	1722	Ditto	100	0	0	953	9	0	227
" Midwifery	1726	Town Council	None			560	4	0	112
" Clinical Medicine	1741?		None			801	3	0	197
" Rhetoric	1762	Crown	100	0	0	134	8	6	92
" Natural History	1767	Ditto	100	0	0	714	0	0	170
" Materia Medica	1768	Town Council	None			1281	0	0	403
" Practical Astronomy	1786	Crown	120	0	0	None			None
" Agriculture	1790	Town Council, University, and Judges of Courts of Session and Exchequer	50	0	0	63	0	0	32
" Clinical Surgery	1803	Crown	100	0	0	611	2	0	124
" Military Surgery	1806	Ditto	100	0	0	75	19	0	38
" Medical Jurisprudence and Police	1807	Ditto	100	0	0	10	10	0	6
" Conveyancing	1825	Town Council, Writers to Signet, and Deputy Keeper of Signet	120	0	0	442	0	0	119
" General Pathology	1831	Town Council	Unknown.			Unknown.			Unknown.

A few observations, however, must be added in explanation of some parts of this statement.

The professorships are considered as divided into the four faculties, or classes, of arts, law, medicine, and theology; "although," according to the Report, "as to some of them it has not yet been decided to which class they should be assigned." The professorships of Universal History and of Agriculture are particularly mentioned as in this predicament. None of these faculties, it is added, "can be traced to any deed, act, regulation, or constitution of a faculty."

The Principal is considered as *ex-officio* convener of the faculty of theology. The others have each a dean or convener chosen by the faculty.

There is considerable discordance among the statements given in different parts of the Report as to the dates at which the chairs were founded. The four professorships set down as being founded in 1708 were evidently the four regentships, which, along with the principalship, constituted the original establishment of the college, but the holders of which, as already mentioned, were not confined to the teaching each of a particular department till the date here given. The writer of the Report (p. 117) perplexes himself unnecessarily by overlooking this fact. A professorship of Law, it is said in one place (p. 117) was appointed so early as 1588. The present law-school of Edinburgh, however, must be considered as not older than the commencement of the last century, and the medical school as dating from the close of the century preceding. It was not, indeed, till a considerably later period that the latter began to acquire celebrity.

In the few cases in which the right of appointing the professors is shared by the town council with other parties, the mode of the interference of the latter is not uniform. The professors of Scotch Law, of Civil Law, and of Civil History are elected by the council from a leet (as it is called) of two names in each case, submitted by the Faculty of Advocates; a form which, in effect, gives the appointment to the latter body. In the appointments to the chairs of Humanity, Agriculture, and Conveyancing, delegates from the different bodies meet and vote. The professor of Botany holds two commissions, one from the crown as Regius Professor of Botany and Keeper of the Garden, and another from the town-council, as Professor of Medicine and Botany. The class of Clinical Medicine is taught in rotation by certain of the medical professors, according to an arrangement among themselves.

The sums mentioned in the column of salaries include the grants from the crown and the allowances made to some of the professors for house-rent, as well as what are properly called their salaries. The salary and class fees added together give the entire average emoluments of the professorship. The calculations however are, for the most part, made on returns for the five years preceding 1826, and might possibly require to be considerably modified in order to be applicable to the present time. The professors of Divinity and Ecclesiastical History received no fees at the date of the Commissioners' Report; but they are now, we believe, paid two guineas by each student, which would give them about the sums assigned to them in the table. The salary of the professor of Public Law, who teaches no class, is in part made up of a pension of 200*l.* a year from the crown, which the present professor holds so long as he retains the office. The fees at the different classes vary from two to four guineas. The total number of students was, in 1811, 1644; in 1821, 2224; and in 1825, 2236.

For 50 years preceding 1826 the total number of graduates in arts was only 168. During the same period 100 degrees of D.D. were conferred; and 56 of LL.D. The number of medical degrees was 18 in 1776; 32 in 1786; 31 in 1796; 37 in 1806; 76 in 1816; and 118 in 1826. Yet it is stated that the number of medical students was 764 in 1806, and only 896 in 1826.

There is only one regular university session, or term, in the year, beginning on the last Wednesday of October, and ending the last day of April. Some of the classes, however, are not taught for the whole of this time. Of late years a few of the classes, principally of the medical faculty, have also been taught during a summer session, beginning with the 1st of May, and ending with the 31st of July. Each class meets only for an hour at a time; but some of them meet twice in the day; and some of the professors have two or three classes.

No academical dress is worn by the students; no attendance upon divine service is enforced; and scarcely any discipline can be said to be exercised beyond the walls of the class-room. The students are examined in several of the classes; but there is no public examination of any kind in the university.

Schools.—The oldest of the Edinburgh schools is the High School, originally instituted in 1519, and re-erected, upon having fallen into decay, in 1577; it now consists of a rector and four other Greek and Latin masters, a teacher of writing, a teacher of arithmetic and mathematics, and a teacher of French. The Edinburgh Academy, also principally for instruction in the classics, was founded in 1824, and consists of a rector and four other classical masters, with teachers of English, French, mathematics, and writing. Among the other educational establishments are the Hill-street Institution, opened in 1832, and furnished with teachers of the classics, English, elocution, writing, geography, history, natural history, mathematics, arithmetic, French, German, Italian, and drawing; the Circus Place school, having a rector and five other masters; the Southern Academy, instituted in 1829; the Ladies' Institution for the Southern districts, founded in 1833; the Scottish Institution for the Education of Ladies, founded in 1834; the School of Arts, Mechanics' Institute; Dr. Bell's School, attended by about 400 children; the schools of the Lancasterian School Society, in which there are about 600 boys and girls; and a well-known school, called the Sessional School, so ably conducted by Sheriff Wood.

EDINGTONITE, a rare crystalline mineral, which occurs in the cavities of Thomsonite, near Dumbarton; its crystals are small and distinct, greyish white, translucent, and have a square prism as their primary form. Cleavage parallel to the lateral planes; fracture uneven; hardness 4·0,4·5; sp. gr. 2·7; lustre vitreous. According to Turner, it contains silica 35·09; alumina 27·69; lime 12·68; water 13·32; and probably 10 to 11 per cent. of some alkali.

EDMUND I., king of the Anglo-Saxons, was the son of King Edward the Elder, by his third wife Edgiva. He appears to have been born in 923, or about two years before his father's death. He succeeded his half-brother Athelstane, 27th October, 941. Immediately after his accession the Danish people of Northumbria rose in revolt under the same Anlaf (as the name is commonly given, but it should probably be Aulaf) or Olave, who had been defeated by Athelstane some years before in the great battle of Brunanburgh, and forced to flee to Ireland. After the war had lasted about a year, an accommodation was brought about by the Archbishops Odo and Wolstan, by which it was arranged that all the territory to the north of Watling-street should be given up to Olave. These terms prove that Edmund had by no means the best of the contest. Fortunately for him, however, the Danish earl died the next year; and Edmund, by a prompt and vigorous use of the opportunity, was successful in recovering all that he had lost. In 945 he also succeeded in reducing the hitherto independent state of Cumbria (including the modies, Cumberland and Westmoreland), which, after cruelly putting out the eyes of the two sons of the king, Dunmail, he made over to Malcolm I. of Scotland, to be held by him as the vassal of the English crown. The reign of Edmund, which was distinguished not only for his personal courage, but for his taste for elegance and splendour, on which account he received the surname of the Magnificent, was terminated on 26th May, 946, by a death-blow which he received from an outlaw of the name of Liof, who had the audacity to present himself at the royal table, as the king was celebrating the feast of St. Augustine at Pucklekirk, in Gloucestershire. Edmund, on his refusal to leave the room, rose himself to assist in expelling him, when the ruffian, with a dagger which he had concealed under his clothes, stabbed him to the heart. King Edmund I. left, by his wife Elgiva, two sons, Edwy and Edgar, who eventually both sat on the throne; but as they were mere children at the time of their father's decease, they were set aside for the present, and his immediate successor was his brother Edred.

EDMUND II., king of the Anglo-Saxons, surnamed Ironside, either from his great strength, or the armour which he wore, was the son of king Ethelred II., and was born A.D. 989. According to the account that has commonly been received, his mother was Elgiva, or Ethelgiva, the daughter of earl Thored, or Toreth, who was Ethelred's first wife. Other authorities, however, assert that the mother of Edmund, and also of several of his brothers, was a foreign lady, who was only Ethelred's concubine. On the whole, the point of his legitimacy must be considered doubtful. Among modern historians, Lingard has set him down as the eldest son of Etheldred by his first wife, without intimating that any other account has been given. Turner describes him in one place as illegitimately born, in another, as the son of Ethelred by an earl's daughter whom he had married. (*Hist. Ang. Sax.*, ii., 314 and 323. edit.)

Edmund appears, in the history of the latter years of his

Athelred's calamitous reign, as the chief champion of the English cause against Canute and his Danes, who had, by this time, nearly overrun the kingdom. On the death of Ethelred in 1016, Edmund was proclaimed king by the burgesses of London, and soon after, at least all the kingdom of Wessex, the hereditary dominion of his family, and which was now considered as comprehending the whole territory to the south of the Thames, appears to have submitted to his authority. He had the year before, by a marriage with Elgiva, the widow of Sigeferth, a Thane of Danish descent, who had been put to death by Ethelred, made himself master, in defiance of the deposed and dying king, of possessions of great extent; and the power he thus acquired is supposed to have materially assisted him in acquiring the throne.

The short reign of Edmund was nearly all spent in a continuation of the sanguinary struggle in which he had already so greatly distinguished himself. His exploits are dwelt upon by the old national chronicles with fond amplification, but it is not very easy to separate what is of historical value in these narratives from the romantic decorations. Immediately on Edmund's accession, the Danish forces appear to have besieged London. The English king remained in the capital till it was considered secure; after which we find him engaging Canute, first at Pen, in Dorsetshire (or, according to another account, near Gillingham, in Somersetshire); and then at a place called Sceorstan, which is supposed to be the spot still marked by a stone at the meeting of the four counties of Oxford, Gloucester, Worcester, and Warwick. In both these fights Edmund appears to have been victorious; that of Sceorstan lasted two days. A third engagement took place at Brentford, the issue of which is disputed. Soon after the two armies met again at Otteford, or Otford, in Kent, when the Danes were defeated with great slaughter. Finally, however, Edmund sustained a decisive discomfiture at the great battle of 'Assandun,' supposed to be Assington, in Essex. After this, according to one account, which, although it has been generally discredited by modern historians, is not without some features of probability, Canute and Edmund agreed to decide their quarrel by single combat, and the encounter accordingly took place on an islet called Alney, or Olney, in the Severn, which some place near Deerhurst, others near Gloucester, between Over-bridge and Maysemore. The result was that Canute was forced to yield and sue for his life. Whether the single combat took place or not, it is certain that an arrangement between the parties was now made, by which Mercia and Northumbria were made over to Canute; while Edmund was allowed to retain possession of the rest of the kingdom, with the nominal sovereignty of the whole. It is also said to have been stipulated that when either should die the other should be his successor. Edmund died a few weeks after this pacification, having worn the crown only about seven months; and although there is considerable variation and obscurity in the accounts of his death, there are strong reasons for believing that he was made away with by the contrivance of Canute. The northern historians state this in distinct terms. Canute immediately mounted the vacant throne A.D. 1016. Edmund Ironside left by his wife Algitha two sons, Edward, called the Outlaw, and another, whom some call Edmund, others Edwin, and of whom it is not known whether he was elder or younger than Edward. [See Edgar Atheling.]

EDOLIUS. [Lanius.]

EDOM. [Idumea.]

EDRED, king of the *Anglo-Saxons*, was the youngest of the sons of Edward the Elder, his mother being Edgiva, the second (or, according to some, the third) wife of that king. [Edward the Elder.] When the throne became vacant, in 946, by the death of his elder brother, Edmund I., Edred was recognised as his successor, Edwy and Edgar, the two sons of Edmund, being considered to be excluded for the present by their extreme youth. Edred was in a bad state of health when he came to the throne, and he does not seem ever to have recovered. Yet he is recorded to have, soon after his accession, repressed in person an insurrection of the turbulent Danish population of Northumbria, and he appears to have reduced that province to greater quiet and subjection than any of his predecessors. In these military operations, as well as in the management of civil affairs, he was mainly directed by the counsels of his chancellor Turketul, who had served in the same capacity under the two preceding kings, Athelstan and Edmund. Another distinguished character of this reign was the celebrated Dunstan, who owed his first rise at court to the patronage of Turketul, and acquired under Edred that extraordinary power in the state which he preserved during several succeeding reigns. [Dunstan.] Edred died, after a reign of between nine and ten years, on the 23rd of November (St. Clement's Day), A.D. 955, and was succeeded by his nephew Edwy, the eldest of the two sons of his predecessor king Edmund.

EDRIOPHTHALMA (Leach), a legion of crustaceous animals with sessile eyes, which are generally compound, but sometimes simple, situated on the sides of the head. The mandibles are often furnished with a palp, and the head is almost always distinct from the body.

Desmarest makes the *Edriophthalma* comprehend the *Amphipoda* of Latreille, which, the former observes, Leach has not admitted, and which includes the two first sections of his legion of *Malacostraca Edriophthalma*, and corresponds to the genus *Gammarus* of Fabricius.

The *Amphipoda* are characterized as having a *head* distinct from the trunk, and formed of a single piece; *mandibles* provided with a palp; jaws to the number of three pairs, the external pair of which represent a lip with two palps or two small feet united near its origin; a *body* laterally compressed, and divided into seven segments; fourteen *feet*, of which the anterior are often terminated by a claw with a single finger; vesiculous *branchiæ* situated at the internal base of the feet, with the exception of that of the anterior pair; *tail* composed of from six to seven articulations, and bearing underneath five pairs of *false feet*, in form of filaments, with two very moveable branches; and thus divided by Desmarest:—

The first section consists of those species whose antennæ are inserted one on each side of the front; whose tail is terminated by styliform filaments; and whose head is large and vertical. Example, *Phronima*, Latr., Leach, Lam., &c. &c. *Cancer*, Herbst, Forsk.

The second (not admitted by Leach) comprises those with four antennæ; two flattened leaflets serving for fins, placed at the end of the tail in place of the styles; and the head large and vertical. Example, *Hyperia*, Latr.

The third includes those which have four antennæ; the tail terminated by styliform filaments; the head moderately large and not vertical, and contains six divisions, some of which are subdivided. *Talitrus*, Latr.; *Atylus*, Leach; *Dexamine*, Leach; *Melita*, Leach; *Gammarus*, Fabr.; *Podocerus*, Leach; *Corophium*, Latr.; *Cerapus*, Say, may be taken as examples of some of the forms of these divisions and subdivisions.

The other orders arranged by Desmarest under the *Edriophthalma* are the *Læmodipoda*, Latr., and the *Isopoda*, Latr.

Mr. Milne Edwards makes the *Edriophthalmians* consist of the same orders, placing them as a legion of the subclass of *maxillated crustaceans*, next to the legion of *Podophthalmians*.

EDRISI, with his complete name Abu-Abdallah Mohammed ben Mohammed ben Abdallah ben Edris, a well known Arabian writer on Geography, who flourished about the middle of the sixth century of the Mohammedan era. Of the circumstances of his life little is known. He was a descendant of the family of the Edrisides, who for upwards of a century possessed the sovereignty over the Mohammedan provinces of Northern Africa. When, in A.D. 919, the Edriside dynasty in Africa was overthrown by Mahedi Abdallah, the survivors of the family went to Sicily; and there our Edrisi seems to have been born. The geographical treatise, which has made his name celebrated, was written at the command of Roger II., king of Sicily, whom he frequently mentions in the body of the work; he informs us in the preface that he completed it in the year 548 of the Hegira, A.D. 1153-4; and that it was intended to illustrate a silver terrestrial globe, 450 Greek pounds in weight, which King Roger had caused to be made. The time at which he wrote it is further ascertained from an incidental allusion to the fact of the town of Jerusalem being then in the possession of the Christians, which occurs in the work, and to the capture of Tripolis and Bona by Roger, which events happened in the years 540 and 548 of the Hegira (1145-6 and 1153-4 of our era). The work itself also affords internal evidence of its having been written by a person who had visited Spain and Italy. Gabriel Sionita and Johannes Hesronita, who in

1619, published a Latin translation of an abridgment of Edrisi's work, were induced by an erroneous reading of the only manuscript which they had, in a passage where Edrisi speaks of the Nile dividing the country adjoining it into two halves (*ardinâ* 'our country' instead of *ardihâ* 'its country,' the true reading), to suppose him a native of Nubia; and this mistake gave occasion to the designation of *Geographus Nubiensis*, under which Edrisi, of whose real name the translators were ignorant, soon became universally known. His work bears the title *Nuzhat al-mushtâk fi ikhtirâk al-âfâk*, *i.e.* 'Amusement of the curious in the exploring of countries.' Besides the abridged translation above-mentioned, we now possess the first volume of a French version of what seems to be the complete original work, by M. Amédée Jaubert, made from two Arabic manuscripts, the one found in the royal library at Paris, the other (which is accompanied with maps) recently procured in Egypt by M. Asselin, and now likewise belonging to the Bibliothèque du Roi. Two other manuscripts of the original work of Edrisi are preserved in the Bodleian library at Oxford (Cod. Graves, No. 3837, and Cod. Pocock, 375), an edition and English translation of which, by the Rev. G. C. Renouard, was some years ago announced as preparing for the press under the auspices of the London Oriental Translation Committee. The globe which this treatise was intended to illustrate is entirely lost; but a planisphere, which is inserted in one of the Bodleian manuscripts, may be seen engraved in Vincent's 'Periplus of the Erythrean Sea,' who observes (p. 568) that 'it is evidently founded upon the error of Ptolemy, which carries the coast of Africa round to the east, and forms a southern continent totally excluding the circumnavigation into the Atlantic Ocean.' It appears, from a comparison of this planisphere with the maps of Fra Mauro and the globe of Martin Behem at Nüremberg, that for upwards of three centuries the globe of Edrisi remained the foundation upon which all subsequent representations of the earth's surface were constructed. In his descriptive treatise, Edrisi, like all other Arabian geographers, distributes the portion of the globe known at his time into seven climates, each of which he subdivides into ten regions: in the account which he gives of them he follows the uniform plan of proceeding from west to east; but he does not, like Abulfeda, determine the longitude and latitude of the places which he mentions. The abridgment of the work contains little more than an itinerary of these different regions; but the original performance now translated adds many remarks on their inhabitants, natural productions, &c. Edrisi frequently refers to writers that have preceded him: among others to an Arabic translation of Ptolemy of Claudias, to Abdallah ben Khordadbeh, and Masudi.

The Arabic text of the abridgment of Edrisi's work, which is now extremely scarce, appeared under the following Latin title: *De Geographia universali, Hortulus cultissimus, mire orbis regiones, provincias, insulas, urbes, earumque dimensiones et orizonta, describens;* Romæ, in typographia Medicea, 1592, 4to. The Latin translation of the same by Gabriel Sionita and Johannes Hesronita, bears the title: *Geographia Nubiensis, id est, accuratissima totius orbis in septem climata divisi descriptio;* Paris, 1619, 4to. Of other publications relating to the work of Edrisi, we shall mention only two: *Descripcion de España de Xerif Aledris conocido por el Nubiense; con traduccion y notas de* Don J. A. Conde; Madrid, 1799, 8vo.: and J. M. Hartmann's *Commentatio de Geographia Africæ Edrisiana;* Göttingen, 1791, 4to. The first volume of M. Jaubert's French translation has appeared under the auspices of the French Geographical Society, and forms the fifth volume of the 'Recueil de Voyages et de Mémoires,' published by that society. It has also the following separate title: 'Géographie d'Edrisi, traduite de l'Arabe en Français, d'après deux MSS. de la Bibliothèque du Roi, et accompagnée de notes par M. Amédée Jaubert.' Paris, 1836, 4to.

EDUCATION is the art of preparing youth for the business of after-life. This is not offered as a complete or exact definition; it is only proposed as sufficient to indicate in a general way the subject matter here under discussion.

In every nation, even those called uncivilized, there are, and necessarily must be, certain practices and usages according to which children are instructed in those things which are to form the occupation of their future life; and every civilized nation, and, we may presume, nations also called ʼilized, have some general and collective term by which they express this process of instruction. In the European languages derived from the Latin, and in others that have a mixture of that language, the general term is Education. It is not important at present to consider the more or less precise notions attached to this or any other equivalent word, but it is enough to observe, that, as the language of every nation possesses such a term, it is a universal truth that all nations or societies of men admit that there is something which is expressed by the comprehensive term Education, or by some equivalent term. But like all other general terms which have been long in use, this term Education comprehends within the general meaning already assigned to it a great number of particulars, which are conceived by various people in such different modes and degrees and in such varying amount as to the number of the particulars, some nations or individuals conceiving a certain set of particulars as essential to the term, others conceiving a different set of particulars as essentials, and others again conceiving the same particulars in such different ways, that two or more persons agreeing in their general description of the term might very probably, in descending into the enumeration of the particulars, find themselves completely at variance with one another. This remark possesses no claim to novelty, but it is not on that account the less important. The discrepancy just stated is apparent not only as to such general terms as education, government, right, duty, and numerous other such words, the analysis of which can only be successfully attempted by those who are accustomed to that kind of inquiry, but it is perceived and occurs even in things obvious to the senses, which consist of a number of parts, such as a machine, or any other compound thing. The *general* use of a machine, as a mill, for instance, is conceived in the same way by all, by the miller and by persons who know nothing more about the mill than that it is used for grinding corn. As to the particulars, there may be all imaginable discrepancies among the persons who are only acquainted with the general purpose of the mill. But discrepancies as to the mode in which the several parts of a thing and the uses of the several parts are conceived, are generally discrepancies to be referred to the *inaccuracy* of the conceptions; they are, in fact, only errors, not the same but about the same thing. The more completely a large number of persons approach to harmony in their whole views as to the machine, the nearer, as a general rule, do their several views approach to accuracy; it being of the nature of truth to produce a harmony of opinion, the truth being one and invariable; and it being of the nature of error to admit of more varieties than man has yet conceived, inasmuch as men yet unborn will conceive errors never conceived before.

The same holds good as to Education which holds good of the machine. The *general* use, the *general* object of Education is roughly and rightly conceived by all persons to whom the name is familiar; but the great contrariety which exists among mankind as to the particulars which they conceive as entering into and forming a part of the term, and as to their mode of conceiving the same, proves either that all are still wrong as to their particular conceptions of this term, or that hitherto no means have been discovered of producing a general harmony of opinion, or in other words, of approaching to the truth. And hence there is no person, or class of persons, who, as in the case of the miller, is or are allowed to be an authority competent to decide between conflicting opinions.

In every society, Education (in what particular manner conceived by any particular society is of no importance to our present inquiry) is, as a *general* rule, and must necessarily be, subjected to the positive law of the society, and to that assemblage of opinions, customs, and habits which is not inappropriately called by some writers the Positive Morality of Society, or the Law of Opinion. This truth, or truism, as some may call it, is the basis of every inquiry into Education. In no country can there exist, as a general rule, an Education, whether it be good or bad, not subordinate to the law as above explained: for if such Education could exist, the form of that society or political system could not co-exist with it. One or the other must be changed, so that on the whole there must at last result a harmony, and not a discord. In every country then there does exist Education, either directed by and subordinate to the Positive Law and Positive Morality of that country, or there is an Education not so directed and subordinate, and consequently inconsistent with the continuance of that political system in which it exists. But such an anomaly, if found anywhere, should not be allowed to exist, because it is inconsistent with the continued existence of the society in which it has established itself; and if such an Education does exist, and can maintain itself in a society, against the will of that society, such a society is not a sovereign and independent society, but is in a state of anarchy. Education then should be in harmony with and subordinate to the political system: it should be part of it; and whether the political system is called by the name good or bad, if that political system is to continue, Education must not be opposed to it, but must be a part of it. From this it follows that the question, What is the best Education? involves the question, What is the best political system? and that question again cannot be answered without considering what are the circumstances of the particular nation or society as to which we inquire what is the best political system. Recollecting however that the question of the best Education and of the best political system cannot be discussed apart, because, as we have shown, Education is a part of the system, still we can consider several important questions quite as fully as if the former question were out of the way.

One is, the political system being given, what ought the Education to be?

And, how far is it the business of the state to direct, control, and encourage that Education?

A man (under which term we include woman) has two distinct relations or classes of relations towards the state: one comprehends his duties as a citizen, wherein he is or ought to be wholly subordinate to the state; the other comprehends all his functions as a producer and enjoyer of wealth, wherein he has or ought to have all freedom that is not inconsistent with the proper discharge of his duties as a citizen. It is barely necessary to state this proposition in order to perceive that his Education as a citizen should be directed by the state. To suppose any other directing power, any power for instance which may educate him in principles opposed to the polity of which he is to form a part, is to suppose an inconsistency which, in discussing any question involving principles, we always intend to avoid.

His Education then as a citizen, it must be admitted, ought to be under the superintendence of the state; but *how* ought the state to exercise this superintendence?

It is not our purpose to attempt to answer this question, which involves the consideration of some of the most difficult questions in legislation. It is our object here to present the questions which it belongs to the civilization of the present and future ages to solve; to show *what* is to be done, not *how* it is to be done.

But we may answer the question so far as this: the state having the superintendence of the citizen's Education, must have the superintendence of those who direct that Education; in other words, must direct those who are to carry its purposes into effect. The body of teachers therefore must be formed by, or, at least, must be under the superintendence of the state. Unless this fundamental truth is admitted and acted on, the state cannot effectually direct or superintend the Education of its citizens.

Every branch of this inquiry into Education runs out into other branches almost innumerable, till we find that the solution of this important question involves the solution of the greater part of those questions which occupy or ought to occupy a legislative body. For this reason, as above stated, we cannot attempt to answer in its full extent, *how* the state must direct the Education of its citizens, because this question involves the consideration of how far the direction and control of the state should be a matter of positive law imperative on all, how far and with respect to what particular matters it should encourage and give facilities only, how far it should act by penalties or punishment, how far it should allow individuals or associations of individuals to teach or direct teaching according to their own will and judgment, or, to express the last question in other words, whether and to what extent the state should allow competition in Education?

To these questions, and more especially to the last, the answer is in general terms, that the *general* interest, considered in all its bearings, must determine what and how much the state must do. This answer may be said to determine nothing. It is true it determines no particular thing, but it determines the principle by which all particular measures must be tested; and it would not be difficult to select instances even from our legislation, where enactments relating to places of education have been made with a view to particular interests only, without a reference to all the bearings of the question, and which, consequently, if tried by the test above given, would be found to be mischievous. As to the last question the answer more particularly is,—that individual competition must not be destroyed. It is possible to reconcile the two principles of state direction and control and individual competition. The state may allow no person to teach without being examined and registered such register will show if he has been trained under the superintendence of the state or not. This fact being established, it may be left to individuals or associations of individuals to employ what teachers they please. In all the schools founded by the state, in all schools under the superintendence of the state (to which latter class belong nearly all charitable foundations, and all such foundations which are not under the superintendence of the state ought, consistently with the general principles already laid down, to be brought under that superintendence), it follows as a matter of course that none but teachers trained by the state should be appointed. The selection of the teachers, out of the whole authorized body, for any particular school of the class just described, may be safely left to the local authorities who have the immediate superintendence of these schools.

If the principle that a state ought to exercise the superintendence of the Education of its citizens as citizens be admitted, it may be asked, how far and to what branches of knowledge does this extend? To this we reply that a precise answer can only be given by the legislature of each country, and the question cannot be answered without many years of labour and perhaps without many experiments. But it follows from the principles already laid down that no citizen ought to exercise any function of government, or be intrusted with the exercise of any power delegated by the state, without having received *some* (*what*, we cannot here say) Education under the superintendence and direction of the state.

When the sovereign is one, it is clear how he will and ought to direct the Education of his people. His first object must be to maintain the stability of his own power. It is an absurdity to suppose any Education permitted in any state which shall be *inconsistent* with the existence of that state; and consequently in a monarchy, the first object is and must be the preservation of the monarchy. It is unnecessary to show that the attainment of this object is by no means inconsistent with good Education, and Education which is good when considered with reference to other objects than the conservation of the monarchy.

In a democracy [DEMOCRACY] the business of the state is also plain and easy. It is not plain *how* far and to *what* classes of subjects the superintendence of the state should extend, for that may be as difficult to determine in a democracy as in any other form of government; but it *is* plain to what objects the superintendence of the state in such a community should extend. Its objects should be to maintain in all its purity the principle of individual political equality, that the sovereign power is in all and every person, that the will of the majority is the rule which all must obey, and that the expression of opinion on all subjects, by speaking or writing, should be perfectly free. If any checks are wanting on the last head, they will always be supplied in a democracy by the positive morality of the society in a degree at least as great as is required, and certainly in a greater degree than in any other form of government.

What must the state do in a political system which is neither a monarchy nor a democracy; in a system where there are contending elements, and none has yet obtained the superiority? The answer is, it must do what it can, and that which it does, being the will of the stronger part for the time, must be considered right. But such a political system, though it may continue for a long time, is always moving (at least it is only safe when it is moving) in the direction impressed upon it by one or other of the contending powers which exist in the state. Still, so long as the struggle continues, there can be no Education in the sense which we are considering, no education which has the single, clear, and undivided object proposed to it in a monarchy and in a democracy. Such a political system then would appear to be wanting in one of the chief elements of a political system, which we have explained to be the bringing up of the citizens in such a manner as to secure the stability of that system under which they live. In such a system as we here imagine, there being no *unity* in the object, there can be no unity of means with reference to any object; and such a system might be more properly called an aggregation of political societies, than one political society; what is implied by the word aggregation being the existence of something just strong enough to keep the whole together. Such a society, in spite of its incongruity, may be kept together by several things: one may be, that the positive morality of the whole society is favourable to order, as characterized by a love of wealth, and impressed with a profound conviction of the necessity of leaving free to every individual the pursuit of wealth and the enjoyment of it when it is acquired. Another may be, that in this same society, though there are contending elements, there may be a slow and steady progress, and a gradual change, tending in one direction only: such a gradual progress in such a system may be regarded as the only security against its destruction.

If the history of the world has ever presented, or if it now presents, such a phænomenon as we have attempted to describe; further, if such a society contains the greatest known number of instances of enormous individual wealth opposed to the greatest amount of abject poverty; the highest intellectual cultivation and the greatest freedom of thought, side by side with the grossest ignorance and the darkest superstition; thousands in the enjoyment of wealth for which they never laboured, and tens of thousands depending for their daily bread upon the labour of their hands and the sensitive vibrations of the scale of commerce; political power in appearance widely diffused, in effect confined to the hands of a few; ignorance of the simplest elements of society in many of the rich and those who have power; ignorance not greater in those who are poor and have none—such a society, if it exists, is a society in which every reflecting man must at moments have misgivings as to its future condition and as to the happiness of those in whom he is most nearly interested. But if such a society contains a class, properly and truly denominated a middle class, a class neither enervated by excessive wealth and indolence nor depressed by poverty; a class that is characterized by industry and activity unexampled; a class that considers labour as the true source of happiness, and free inquiry on all subjects as the best privilege of a free man—such a society may exist and continue to be indefinitely in a state of progressive improvement. Such a society, with its monstrous anomalies and defects, offers to a statesman of enlarged mind and vigorous understanding the strongest motive, while it supplies him with all the means, to give to the political system an impulse that shall carry it beyond the region of unstable equilibrium and place it at once in a state of security.

In such a society the simple enunciation by one possessed of power, that Education is a part of the business of the state, would be considered as the forerunner of some measure which should lay the foundation of that unity without which the temporary prosperity of the nation can never become permanent and its real happiness can never be secured.

The particular questions that the philosophic legislator has then to solve with respect to the education of the citizens, are—1. How are teachers to be taught, and what are they to be taught? 2. How is the body of teachers to be directed, superintended, rewarded, and punished? 3. What schools and what kinds of schools are to be established and encouraged for the Education of the people? 4. What are the teachers to teach in those schools? 5. Where is the immediate government of such schools to be placed? 6. And where the ultimate and supreme direction and control of such schools? The word Schools is here used as comprehending *all* places of Education.

It remains to consider those other relations of a man to the state in which we view him as a producer of wealth for his own enjoyment. Here the general principle is, that the pursuit and enjoyment of wealth must be left as free as the public interest requires; and this amount of freedom will not depend in any great degree on the form of government. To this head, that of the production of wealth, belong all the divisions of labour by which a man, to use a homely but expressive phrase, gets his living, or what in other words [illegible] called the professions, trades, and arts of a country. [illegible] only way in which the state can with any advantage [illegible] or control the exercise of any profession, trade, or art, is by requiring the person who undertakes to exercise it to have been trained or educated for the purpose. Whether this should be done in all cases, or in some and what cases, and to what extent, and how, are questions for a legislature guided by a philosopher to answer.

In all countries called civilized this has been done to a certain extent. The legislation of our own country offers instances of great errors committed by legislating where no legislation was wanted, or by legislating badly. Perhaps instances may also be noted in all countries where evil has arisen for want of legislation on the subject. We may explain by example.

Perhaps it is unnecessary for a state to require that a shoemaker, or a tailor, or a painter, or a sculptor, should be required to go through a certain course of training before he exercises his art. The best shoemaker and best tailor will be sure to find employment, and individual shoemakers and tailors have as ample means of giving instruction in their craft as can be desired. It may be true or not true, that the best painters and sculptors will meet with most employment: but is it unnecessary or is it necessary for a state to offer facilities and encouragement to those who design to educate themselves as painters and sculptors? Most civilized nations have decided this question by doing so, and there are many reasons in favour of such a policy.

Ought the state to require the professor of law, of medicine, or of religious teaching, to undergo some kind of preliminary Education, and to obtain a certificate thereof? Nearly all civilized countries have required the lawyer and physician to go through some course of Education. There are strong reasons in some countries, our own for instance, both for and against such a requisition; but on the whole, the reasons seem to preponderate in favour of requiring such Education from him who designs to practise law, and still more from him who designs to practise the art of healing. Most civilized countries, perhaps all, except two (so far as we know), require *all* persons who profess the teaching of religion to have received some Education, to be ascertained by some evidence. But in both the nations excepted, any person, however ignorant, may preach on subjects which the mass of the community believe or affect to believe to be of greater importance both for their present and future welfare than any other subjects. Professing to maintain, as we believe they always will do, the principle of religious freedom, these two nations have fallen into the greatest inconsistencies. They have checked the free expression of individual opinion by word of mouth, and fettered it in the written form, in the one country by the severe penalties of positive law and the no less severe penalties of positive morality, and in the other by the penalties of positive morality carried to an excess which is destructive to the interests of the society itself. (See Attorney-General v. Pearson, 3 Merivale, 353.) But both nations allow any person, if he professes to be a teacher of religion, however ignorant he may be, to become the weekly, the daily instructor of thousands, including children, who derive and have derived no instruction of any kind except from this source. Such a teaching or preaching, if it only assumes the name and form of religious teaching, is permitted to inculcate principles which may be subversive of the political system, and it may and often does inculcate principles the tendency which is to undermine the foundations of all social order; for it should never be forgotten that all religious teaching must include moral teaching, though moral teaching is quite distinct from religious teaching. And though it must be admitted that no teacher of religion recommends a bad thing *as* bad, he may recommend a bad thing as good solely because he knows no better. We have endeavoured to point out an anomaly which exists in certain political institutions, and which can only be allowed to exist so long as it protects itself under a specious and an honourable but misunderstood name. For though it be admitted that such anomaly exist, it may be said that it cannot be remedied without interfering with the important principle of religious freedom. But what is religious or any other freedom? Is it the individual power of doing or saying what a man likes? Certainly not. It means no more than a freedom not inconsistent with the public welfare. Still it may be urged that this is precisely the kind of freedom with which no state, where the principle of religious freedom is admitted, can safely interfere. But this is only bringing us round again to the question, What is religious freedom? To say that it cannot be interfered with is amounts to an answer to the question. Does what is called religious freedom, as the term is now understood, admitting it to produce much good, produce also any evil? If it does, can the evil be remedied? Is the free exercise of any art or profession, medicine or law, for instance, or the art of instructing children in general knowledge, or perfect freedom in teaching and expounding religious doctrines, inconsistent with the condition of *qualification*?* How the *qualification* is to be ascertained, and what it is to be, is the question; and it is a question which may be answered.

In all that we have said on Education as a subject of legislation, it is assumed either that the state can enforce, if necessary, that which it enacts; or that the enactments of the state will be only the expression of the public will; or that they will be founded on reasons so clear and convincing as to receive, when promulgated, the assent and support of a majority large enough to secure their being carried into effect. If some one of these conditions cannot be fulfilled, the legislation is premature, and will probably be injurious.

The extent of that department of Education with which the legislature should not interfere can only be fixed with precision by ascertaining the extent of its proper, that is, its useful interference. We may state, however, in general terms, that the early and domestic Education of the young of both sexes is in nearly all, perhaps all, modern political systems, placed beyond the reach of direct legislative control by the constitution of modern society. But inasmuch as one of the great functions of government is the instruction, direction, and superintendence of the teaching body, even the domestic Education is not beyond its influence, but will be subjected to it in precisely the same degree as the state shall succeed in forming a body of good teachers. For the importance and value of Education (in some sense or other; it matters not here in what sense) are universally admitted. The objects of Education, it is true, are often misunderstood by parents and those who have the charge of youth, and the means are as often ill-calculated for the end proposed. But this is only a consequence of ignorance, not an indication that Education is undervalued. When better objects and better means are proposed, whether by individual example or by associations of individuals called societies, or by the state, such objects and means will be readily embraced by all who can comprehend them. It being assumed that the objects and means thus presented are desirable in themselves, there can be no obstacle to the reception of them, so far as the state allows the reception to be voluntary, except the ignorance and prejudices (which are, in fact, only ignorance under another name) of those to whom they are proposed. But till this obstacle which ignorance presents is overcome, nothing can be effected in the way of improvement; and it being admitted, that as to the department of education under consideration, direct legislation is not the proper means, some other means must be adopted. Individuals and societies often effect their benevolent objects by example and by the authority of their name and character. The state may do the same. The influence of authority and example is in all countries most powerful when the sovereign power calls them in to its aid. Individuals may do much; societies have done more; but society (the whole, in its collective power) is the body from which all improvements must come that are calculated to operate on the mass. From these considerations we conclude that if any state seriously and anxiously apply itself to the business of forming a body of teachers, it is impossible to foresee how far the beneficial influence of such a body, well organized, may extend. It may penetrate into the house of the wealthy, where the child who is born to the possession of wealth is not thereby secured in the enjoyment of it, or against any one calamity of human life. His wealth may be wasted by improvidence; his health may be enfeebled by indolence and debauchery; his understanding may be cramped and corrupted by vicious Education and bad example; and he may become an object of detestation and contempt, though born to the command of wealth sufficient to purchase all that society has to offer. This influence may also reach and perhaps sooner and more effectually reach, the hovels and the garrets of the poor, where thousands of children are now brought up under such circumstances, that to be unhealthy, vicious, criminal, and unhappy, are the only results which, as a general rule, can follow from the given conditions of their existence. When the unhappy wretch, who cannot be other than what he is, has at last transgressed the limits of the positive morality of society, and got within the verge of the penalties of the law, his crimes are blazoned forth by thousands, the respectable part of society are shocked at the disclosures, and are only relieved from their pain when the criminal is hid in a prison, or his life is taken by the executioner. But the example is soon forgotten, and misery and vice fester in the very heart of society unheeded, till some new warning again startles it from its lethargy.

It may appear almost superfluous to state that the true interest of the sovereign power, considered in all its bearings, must coincide with the interest of the governed; the difference in forms of government or in the distribution of the sovereign power being mainly to be considered a difference in the instruments or means by which an end is to be obtained. Nor is this difference an unimportant one. Where the sovereign power is in all those who as individuals are subject to it, the coincidence of power and of interest is complete; and the nearer any form of government approaches to this distribution of power, the more obvious and the stronger is the principle laid down. The principle may express a common-place truth; but the consequences that flow from it are numerous and important. When it is clear that the state will promote the general good by its regulations, its business is to make regulations. If regulations will not promote the general good, that is a reason for not making them. Now to protect a man in the enjoyment of his property, and to preserve him from the aggressions of others, is a main part of the business of governing. For this purpose restraints and punishments are necessary; immediately, to protect the injured, and give compensation, when it can be given; remotely, to prevent others from being injured, and, so far as it can be done, to reform the offender. But the punishment of any offender, in its extremest shape, can do little more than prevent the same person from offending again. Those who are deterred from crime by his example can at any rate only be those to whom the example is known, and they are a small portion even of the actual society. Generally, then, those who do not offend against the laws, do not offend, either because they have been sufficiently educated to avoid such offence, or because the opportunity and temptation have not been presented to them, or because they know that punishment may follow the crime. But a large class of offenders have not been sufficiently educated to enable them to avoid the commission of crime; a very large number are brought up amidst the opportunities, the temptations, and the example of crime, to oppose all which the single fact of knowing that the crime may be punished (and even that amount of knowledge is not always possessed by the criminal) is all the means of resistance that such persons are armed with. In societies which boast of their wealth, their civilization, and their high intellectual cultivation, such is the feeble barrier opposed by those who have the government of a people between thousands of their fellow-citizens and the commission of crimes the penalties of which are always severe and often cruel.

If the general considerations which we have urged are of any weight, there is no branch of legislation which comprehends so many important questions as are comprehended in the word Education, even when taken in its ordinary acceptation; but when viewed in all its bearings, it is of all questions most peculiarly that which it concerns the present age and the present state of society to determine. That Education was an integral, an essential part of legislation, was clearly seen by the Greeks, to whom belongs the merit of having approached, and often having solved, nearly all the important questions that affect the constitution of society. It was their good fortune to contemplate many truths from a nearer point of view and in a clearer light than we can do now. The relations of modern society are so numerous and complicated, that the mind is bewildered amidst the multiplicity and variety of facts, the claims of opposing interests, and the number and magnitude of the objects which are presented for its consideration. It is only by keeping ourselves as free as possible from mere party influences, and steadily looking to the general welfare as the end to be attained by and the true test of all political institutions, that we can hope to discover and apply the principles which shall secure, so far as such a thing can be secured, the universal happiness of a nation.

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* In discussing a subject of this kind, in a limited space, it is not possible to answer all objections that may be fairly raised, or to state and answer them. For instance, it may be said, if a man mayn't [illegible] to preach without some evidence of qualification, why should a man print a book on religious subjects without some evidence of qualification? The answer is not difficult; [illegible]

'That the legislator should especially occupy himself with the education of youth, no one can dispute; for when this is not done in states, it is a cause of damage to the polity (form of government). For a state must be administered with reference to its polity; and that which is the peculiar characteristic of each polity is that which preserves and originally constitutes it; as, for instance, the democratical principle in a democracy, and the oligarchal in an oligarchy; and that which is the best principle always constitutes the best polity. Further, in every occupation and art a person must receive previous instruction and discipline, in order to the exercising of the occupation or art; consequently also to the enabling him to the exercise of virtue. Now, since the end of every state is one, it is evident that the education must be *one*, and of necessity the same for all, and that the superintendence of the education must be with the public and not with individuals, as it now is, when each individual superintends his own children singly, and teaches them what he chooses. But when things are matter of public concern, the discipline pertaining to them must also be matter of public concern; and we must not consider any citizen as belonging to himself, but all as belonging to the state; for each is a part of the state, and the superintendence of each part has naturally a reference to the superintendence of the whole. In the matter of education, as well as in other matters, the Lacedæmonians deserve praise; for they take the greatest pains about the education of their children, and that, too, as a public concern. That then a state ought to legislate on education and make it a public concern, is clear; but what education is, and how education must be conducted, is a subject for consideration.' (Aristotle, *Politik*, book viii.)

EDWARD I., surnamed the Elder, king of the West Saxons, and with some pretensions to be regarded as king of all England, was the eldest son of Alfred the Great, by his queen Alswitha, the daughter of Earl Æthelred. On the death of his father, 26th October, 901, Edward was recognized by the Witenagemote as his successor; but the throne was contested by his cousin Ethelwald, who was the son of one of the three elder brothers and predecessors of Alfred, but whether of Ethelbald, Ethelbert, or Ethelred, is uncertain. The cause of Ethelwald received from the first the support of the Danes of the north, and by their assistance in 904 he compelled the submission of the people of Essex, and in the following year that of the East Anglians. The contest however was at length terminated, in 906 or 907, by the death of Ethelwald, in a battle fought between his forces and those of Edward. The people of East Anglia returned on this under submission to the king of Wessex, and the Northumbrian Danes concluded a peace with him: but three or four years afterwards we find the Danes breaking this pacification; nor do they appear to have been quieted, or the people of Essex finally brought back to their obedience, till the year 920 or 921. Mercia in the mean time had continued to be governed as a separate state, though subject to the supremacy of Wessex, first by the ealdorman Ethered or Ethelred, to whom it had been entrusted by Alfred, and, after his death in 912, by his widow Ethelfleda, the sister of Edward. The Lady Ethelfleda survived till 920, conducting the affairs of her government with distinguished ability, and all along acting in concert with her brother in his efforts against the Danes and his other enemies. On her death, Edward took the government of Mercia into his own hands. After this, if we may believe the old historians, not only did all the Danes, including even those of Northumbria, make full submission to Edward, but their example was followed by the Welsh and the people of Strathclyde, and the king of the Scots and all his subjects also chose the English monarch as their lord. The military successes however, which must have been achieved to compel the submission of all these neighbouring powers, if such submission actually took place, are not recorded.

Some of the laws of Edward the Elder are preserved; but they do not demand any particular notice. He died in 925, and was succeeded by his eldest son Athelstane, born to him by a shepherd's daughter named Egwina, who is stated by some of the old writers to have been his wife, by others only his mistress. He had also another son and a daughter by Egwina. By another lady, to whom he is allowed to have been married, but whose name is unknown he had two sons and six daughters; and by another wife, Edgiva, he had two sons, Edmund and Edred, both of whom were afterwards kings of England, and two daughters.

EDWARD II., king of the Anglo-Saxons, surnamed the Martyr, was the eldest son of Edgar the Peaceable by his first wife, Elfleda. On the death of Edgar, in 975, the accession of Edward was opposed by a faction headed by his father's widow, Elfrida, who on the pretence that the elder brother was excluded by the circumstance of having been born before his father had been crowned, maintained that the right to the vacant throne lay with her own son Ethelred. To create for herself the appearance of a national party she and her associates proclaimed themselves the patrons of the cause of the married clergy in opposition to Dunstan and the monks; but after a short period of confusion, the latter prevailed in the Witenagemote, and Edward was formally accepted as king by that assembly. Elfrida however seems still to have continued her intrigues; and her unscrupulous ambition at last led her to the perpetration of a deed, which has covered her name with infamy. This was the murder of her step-son by a hired assassin, as he stopped one day while hunting at her residence, Corfe Castle, in Dorsetshire; he was stabbed in the back as he sat on his horse at the gate of the castle drinking a cup of mead. The 18th of March, 978, is the date assigned to the murder of King Edward, who was only in his seventeenth year when he was thus cut off. He was never married, and leaving no children, was succeeded by his half-brother, Ethelred, the only individual then remaining whose birth gave him any pretensions to the throne.

It was in the reign of Edward that the national *council* was held at Calne which is so famous for the catastrophe of the floor giving way, with the exception of the part on which Dunstan and his friends stood. [Dunstan.]

EDWARD III., king of the Anglo-Saxons, surnamed the Confessor, was the eldest of the two sons of Ethelred II. by his second wife Emma, the daughter of Richard I., duke of Normandy. He was born at Islip, in Oxfordshire, probably in the year 1004. In the close of 1013, when the successes of Sweyn, the Dane, drove Ethelred from his throne, and compelled him to retire to the Isle of Wight, he sent over his wife, with Edward and his younger brother Alfred, to Normandy, to the care of their uncle Duke Richard II. Hither Ethelred himself, being assured of a favourable reception, followed his family, about the middle of January, 1014. When, on the death of Sweyn, within three weeks after, Ethelred was recalled by the Witenagemote, he sent back his son Edward along with the plenipotentiaries, whom he despatched previously to setting out himself to complete the arrangements for his restoration. On the death of Ethelred in 1016, Emma and her two sons returned to Normandy. When Canute the Dane obtained the throne in the latter part of the same year by the death of Edmund Ironside, it is affirmed that Duke Richard either fitted out a naval force or threatened to do so, with a view of supporting the claims of his nephew Edward: but this intention, if it ever was entertained, was effectually diverted before it led to any thing by the proposals which now proceeded from Canute for the hand of the widowed Emma. Canute and Emma were married in July, 1017. From this time till the death of Canute in 1035, Edward appears to have remained quiet in Normandy. He is said to have spent his time chiefly in the performance of the offices of religion and in hunting, which continued to be his favourite occupations to the end of his days. On Canute's death, and the disputes for the succession between his sons Harold and Hardicanute, Edward was induced to make a momentary demonstration in assertion of his pretensions: he crossed the channel with a fleet of forty ships, and landed at Southampton; but finding that instead of being supported, he would be vigorously opposed by his mother, who was exerting all her efforts for her son Hardicanute, he gave up the attempt, and returned to Normandy after merely plundering a few villages. In 1037 his younger brother Alfred was tempted by an invitation purporting to come from Emma to proceed to England at the head of another expedition, which terminated in his destruction, brought about apparently by treachery, though there does not seem to be any sufficient ground for the horrid suspicion, which some writers have been disposed to entertain, that the contriver of the plot was his own mother. When Hardicanute became undisputed king of all England by the death of Harold in 1040, he sent for his half-brother Edward, who immediately came to England, where he was allowed a handsome establishment, and appears to have been considered as the heir to the crown in default of issue of the reigning king. Hardicanute died on the 8th of June, 1042, and Edward was immediately recognised as king by the assembled body of the clergy and the nobility; the former, it is said, having been chiefly swayed by Livingus, bishop of Worcester, the latter by the powerful Earl Godwin.

A scheme of opposition to this settlement of the English crown by Magnus, king of Norway, was defeated, after it had put Edward to the expense of fitting out a fleet to maintain his rights, first by the occupation which Magnus found at home in defending himself against another claimant to the Danish throne, Sweyn, the nephew of Canute, and soon after, more effectually, by the death of Magnus. In 1044, Edward, probably in compliance with a promise which he had made to Godwin, married Editha, the only daughter of that earl, having previously informed her, however, that although he would make her his queen, she should not share his bed. This unnatural proceeding, by which Edward gained from his church the honour of canonization and the title of Confessor, and by which, to pass over his treatment of his wife and his violation of his marriage vows, he involved his country in the calamities of a disputed succession, and eventually of a foreign conquest, has been usually attributed to religious motives. The Confessor seems to have been without human affections of any kind. His first act after coming to the throne was to proceed to the residence of his mother at Winchester, and to seize by force not only all her treasures, but even the cattle and corn upon her lands. One account farther states that he endeavoured to destroy her by an accusation from which she freed herself by the ordeal; and though this part of the story has been generally rejected by modern writers, its falsehood is by no means clearly established. The circumstance of Emma (who lived for ten years after this) having, as it would appear, retained her dower, which has been urged in disproof of any criminal charge having been brought against her, is rather a confirmation of the truth of the old account, inasmuch as it is not likely her son would have allowed her to remain thus undisturbed after his first treatment of her, unless her triumphant escape from the ordeal had enabled her for the rest of her life to defy his power.

The public events that form the history of the reign of the Confessor resolve themselves for the most part into a contest between two great parties or interests which divided the court and the country. The connexion between England and Normandy had commenced forty years before the accession of this king by the marriage of Ethelred; but it became very intimate after the accession of Edward, who had spent in Normandy all his life since his childhood, whose tastes and habits had been formed in that country, and all whose oldest personal friends were necessarily Normans. In fact Edward himself, when he came to the throne, was much more a Norman than an Englishman; and he not unnaturally surrounded himself with persons belonging to the nation whose language and manners and mode of life were those with which he had been so long familiar, rather than with his less polished fellow-countrymen. Many Normans came over to England as soon as he became king, and some of the highest preferments in the kingdom were bestowed upon these foreigners. But while the inclinations of Edward were probably from the first with the Normans, he was to a great extent in the hands of the opposite, or English party, from his connexion with Earl Godwin, its head. Besides the influence which he derived from having his daughter on the throne, this powerful nobleman held in his own hands, and in those of his sons, the government of more than the half of all England. The eldest of these sons, Sweyn, very early in the reign of Edward, had been obliged to fly from the vengeance of the law for the daring crime of violating the person of an abbess; but after some time Edward consented, or found himself obliged, to pardon him, and to restore him to all his estates and honours. It was not till the year 1051 that the strength of the English and Norman parties was tried in any direct encounter; but that year, on occasion of a broil which arose out of the visit to England of Edward's brother-in-law, Eustace, count of Boulogne, their long-accumulated enmity broke forth into a violent collision. The first effect was the banishment of all the Godwin family, and the degradation and imprisonment of the queen. At this crisis William, the young duke of Normandy, afterwards king of England, came over with a powerful fleet, and prepared to render Edward what assistance he might have needed. The following summer however witnessed the complete overthrow of all that had been thus accomplished. Godwin and his son Harold forced their way back to the country at the head of armaments which they had prepared, the former in Flanders, the latter in Ireland; a negotiation was entered into with the king, and the issue was, that the earl and his party were restored to greater power than ever; the queen was re-established in her possessions and her place, and the Normans were all expelled from the kingdom.

Earl Godwin only survived this counter-revolution a few months; he died suddenly as he sat at the royal table, on the 15th April, 1053. His son Harold, however, inherited his possessions and his power, and the ascendancy of the family under its new head continued as great as ever during the remainder of the Confessor's reign. In 1055 a dispute arose between Harold and the rival family of Leofric, earl of Leicester, which disturbed the kingdom for nearly two years. Leofric died in 1057; but the feud was continued by his son Alfgar, who called in to his assistance Griffith or Griffin, king of the Welsh. This drew down the vengeance of Harold upon that prince and his subjects; and the issue was, that, after some fighting, Griffin consented to swear fealty to Edward. This event is assigned by the Saxon Chronicle to the year 1056. The war with the Welsh was renewed in 1063; Harold had again the command, and prosecuted hostilities with so much success, that king Griffin's head was cut off by his own subjects, and sent by them to the English king in token of their submission. In 1065 the public tranquillity was for a short time disturbed by an insurrection of the Northumbrians; but this was quelled without bloodshed. Edward died on the 5th of January, 1066, and was buried the following day in the new Abbey of Westminster, which had just been finished and consecrated with great pomp about a week before. On the same day Earl Harold was solemnly crowned king of England. [Edgar Atheling; Harold II.]

England undoubtedly made a considerable advance in civilization during the reign of the Confessor. For this it was indebted partly to the intercourse which Edward's accession opened with Normandy and France, but perhaps in a still greater degree to the freedom which the kingdom enjoyed from those foreign invasions and internal wars which had distracted it, with the exception of some short intervals of tranquillity, for the greater part of a century preceding. The only events, as we have seen, which disturbed the public peace during the reign of Edward, were one or two border wars and local insurrections, none of which occasioned any general disquiet, or lasted for any considerable time. This period accordingly was long traditionally remembered as the happiest that England had known. It formed in the national imagination the bright spot between the time of the Danish rule on the one hand, and that of the Norman on the other; the age of English freedom and independence which succeeded the deliverance of the country from the one foreign conquest, and preceded its subjection to the other. For many generations after the establishment of the Norman power in the island, the constant demand of the great body of the people to their rulers was for the restoration of the laws and customs of the Confessor. But we have no reason to suppose that this king was the author of any entirely new code of laws, or even that he made any material additions to the laws that had been in force before his time. On coming to the throne he was required by the Witenagemote to promise to observe the laws of King Canute, which seem to have been then universally held to be the fairest and the best the nation had known. Edward took an oath in conformity with this demand at his coronation. No laws attributed to Edward remain in Saxon; but there has been preserved, both in Latin and in Romance, or Romanic French, a body of laws and constitutions which the Conqueror is said to have granted at an assembly of the most distinguished of his English subjects, held about four years after his seizure of the crown, and they are described in the title as the same which his predecessor and cousin, King Edward, had before observed. The French text, preserved in Ingulphus, has generally been held to be the original; but Sir Francis

Palgrave has stated reasons which throw considerable doubt upon this supposition. Both versions are given in the most correct form, and accompanied with a learned and valuable commentary, in the Proofs and Illustrations appended to Sir Francis Palgrave's Rise and Progress of the English Commonwealth, pp. lxxxviii.—cxl.

Edward the Confessor has the credit of being the first of our kings who touched for the king's evil. He was canonized by Pope Alexander III. about a century after his death, and the title of the Confessor was first bestowed upon him in the bull of canonization. It may also be mentioned, that the use of the Great Seal was first introduced in this reign.

EDWARD I., king of England, surnamed Long-shanks, from the excessive length of his legs, was the eldest son of King Henry III. by his wife Eleanor, second daughter of Raymond, count of Provence. He was born at Westminster, June 16, 1239. In 1252 he was invested by his father with the duchy of Guienne; but a claim being set up to this territory by Alphonso X., king of Castile, who pretended that it had been made over to his ancestor Alphonso VIII. by his father-in-law, Henry II., it was arranged the following year that the dispute should be settled by the marriage of Prince Edward with Eleanor, the sister of Alphonso, who thereupon resigned whatever right he had to the duchy to his brother-in-law. After this, by letters patent, dated February 14, 1254, we find the lordship of Ireland, and by others dated February 18, in the same year, all the provinces which had been seized from his father, John, by the king of France, granted by Henry III. to his son Prince Edward. (Rymer, I.)

Edward early manifested a character very unlike that of his weak and imprudent father. While yet only entering upon manhood, we find him taking part in important affairs of state. Thus the agreement which Henry made in 1256 with Pope Alexander IV. in relation to the kingdom of Sicily, which the pope granted to Henry's second son Edmund, was ratified by Prince Edward in a letter to his Holiness, still preserved. In 1258 he signed, along with his father, the agreement called the Provisions or Statutes of Oxford, by which it was arranged that the government of the country should be put into the hands of twenty-four commissioners, appointed by the barons; and two years after, when Henry violently broke through this engagement, Edward came over from Guienne, where he was resident, and publicly expressed his disapprobation of the king's conduct. For the next two or three years Edward may be regarded as placed in opposition to his father's government. In 1262, however, Henry, in a visit which he paid him in Guienne, succeeded in gaining him over to his side, and from this time the prince became the king's most efficient supporter. In the summer of 1263, the quarrel between Henry and his barons came to a contest of arms, which lasted, with some brief intermissions, for four years. During this period the military operations on the king's side were principally conducted by Prince Edward. In the beginning he was unfortunate, having been driven first from Bristol and then from Windsor, and having been finally defeated and taken prisoner with his father at the battle of Lewes, fought May 14, 1264. After being detained however about a twelvemonth, he made his escape out of the hands of the earl of Leicester; and on the 4th August, 1265, his forces having encountered those of that nobleman at Evesham, the result was that Leicester was defeated and lost his life, and the king was restored to liberty. From this time Edward and his father carried everything before them till the war was concluded, in July, 1267, by the surrender of the last of the insurgents, who had taken up their position in the Isle of Ely.

Soon after this, at a parliament held at Northampton, Prince Edward, together with several noblemen and a great number of knights, pledged themselves to proceed to join the crusaders in the Holy Land. The Prince accordingly, having first, in a visit to Paris, in August, 1269, made his arrangements with St. Louis, set sail from England to join that king in May, the year following. St. Louis died on his way to Palestine; and Edward, having spent the winter in Sicily waiting for him, did not arrive at the scene of action till the end of May, 1271. Here he performed several valorous exploits, which however were attended with no important result. His most memorable adventure was an encounter with a Saracen, who attempted to assassinate him, and whom he slew on the spot, but not before he had received a wound in the arm from a poisoned dagger, from the effects of which he is said to have been delivered by the princess, his wife, who sucked the poison from the wound. At last, having concluded a ten years' truce with the Saracens, he left Palestine in August, 1272, and set out on his return to England. He was at Messina, on his way home, in January, 1273, when he heard of the death of his father on the 16th of November preceding. He proceeded on his journey, and landed with his queen in England 25th July, 1274. They were both solemnly crowned at Westminster on the 19th of August following. The reign of Edward I., however, appears to have been reckoned not from the day of his coronation, according to the practice observed in the cases of all the preceding kings since the Conquest, but, according to the modern practice, from the day on which the throne became vacant, or at least from the 20th of November, the day of his father's funeral, immediately after which the clerical and lay nobility who were present in Westminster Abbey on the occasion had sworn fealty to the new king at the high altar of that church.

The first military operations of Edward's reign were directed against the Welsh, whose prince Llewellyn, on being summoned to do homage, had contemptuously refused. Llewellyn was forced to sue for peace in November, 1277, after a single campaign; but in 1281 he again rose in arms, and the insurrection was not put down till Llewellyn himself was slain at Llanfair, 11th December, 1282, and his surviving brother Prince David was taken prisoner soon after. The following year the last-mentioned prince was barbarously put to death by drawing, hanging, and quartering, and Wales was finally united to England.

The conquest of Wales was followed by the attempt to conquer Scotland. By the death of Alexander *III.*, in 1285, the crown of that country had fallen to his grand-daughter Margaret, called the Maiden of Norway, a child only three years old. By the treaty of Brigham, concluded in July, 1290, it was agreed that Margaret should be married to Edward, the eldest surviving son of the English king; but the young queen died in one of the Orkney Islands on her voyage from Norway in September of the same year. Edward made the first open declaration of his designs against the independence of Scotland at a conference held at Norham on the Tweed with the clergy and nobility of that kingdom on the 10th of May, 1291. The different competitors for the crown had advanced their claims; but they were all induced to acknowledge Edward for their lord paramount and to consent to receive judgment from him on the matter in dispute. His decision was finally pronounced in favour of John Balliol, at Berwick, on the 17th of November, 1292; on the next day Balliol swore fealty to him in the castle of Norham. [Balliol.] He was crowned at Scone under a commission from his liege lord on the 30th of the same month; and on the 26th of December he did homage to Edward for his crown at Newcastle. The subject king, however, was soon made to feel all the humiliation of his position; and the discontent of his countrymen equalling his own, by the summer of 1295 all Scotland was in open insurrection against the authority of Edward. Meanwhile, Edward had become involved in a war with the French king Philip IV. The first act of the assembled estates of Scotland was to enter into a treaty of alliance with that sovereign. But although he was further embarrassed at this inconvenient moment by a revolt of the Welsh, Edward's wonderful energy in a few months recovered for him all that he had lost. In the spring of 1296 he laid a great part of Scotland waste with fire and sword, compelled Balliol to resign the kingdom into his hands, and then made a triumphant progress through the country as far as Elgin in Murray, exacting oaths of fealty from all classes wherever he appeared. It was on his return from this progress that Edward, as he passed the cathedral of Scone in the beginning of August, carried away with him the famous stone, now in Westminster Abbey, on which the Scottish kings had been accustomed to be crowned. He now placed the government of Scotland in the hands of officers appointed by himself, and bearing the titles of his ministers. But by the month of May in the following year Scotland was again in flames. The leader of the insurrection now was the celebrated William Wallace. He and his countrymen had been excited to make this new attempt to effect their deliverance from a foreign domination, partly by the severities of their English governors, partly by the circumstances in which Edpend was at this time involved. The expenses of his Scottish and French wars had pressed heavily upon the resources of the kingdom; and when he asked for more money, both clergy and laity refused him any farther grant without a redress of grievances and a confirmation of the several great national charters. After standing out for some time, he was obliged to comply with these terms; Magna Charta and the Charter of Forests were both confirmed, with some additional articles, in a parliament held at Westminster in October of this year.

Meanwhile, although he had got disencumbered for the present of the war on the Continent, by the conclusion of a truce with King Philip, the rebellion in Scotland had already gained such a height as to have almost wholly cleared that country of the English authorities. The forces of the government had been completely put to the rout by Wallace at the battle of Stirling, fought on the 11th September, and in a few weeks more not a Scottish fortress remained in Edward's hands. Wallace was now appointed Governor of Scotland, in the name of King John (Baliol). In this state of things Edward, about the middle of March 1298, returned to England from Flanders where he had spent the winter. He immediately prepared to march for Scotland. The great battle of Falkirk followed on the 22nd of July, in which Wallace sustained a complete defeat. But although one consequence of this event was the resignation by Wallace of his office of governor, it was not followed by the general submission of the country. The next five years were spent in a succession of indecisive attempts on the part of the English king to regain possession of Scotland; the military operations being frequently suspended by long truces. At length, having satisfied his barons by repeated renewals of the charters, and having finally relieved himself from all interference on the part of the king of France by a definitive treaty of peace concluded with him at Amiens on the 20th May, 1303, Edward once more set out for Scotland at the head of a force too numerous and too well appointed to be resisted by any strength that exhausted country could now command. The result was again its temporary conquest and merciless devastation from the Tweed to the Moray Frith. The Castle of Stirling was the last fortress that held out; it did not surrender till the 20th of July in the following year. Edward meanwhile had wintered in Dunfermline; he only returned to England in time to keep his Christmas in Lincoln. Wallace fell into his hands in a few months afterwards, and was hanged, drawn, and quartered as a traitor, at Smithfield in London, on the 23rd August, 1305. But another champion of the Scottish independence was not long in appearing. Robert Bruce, Earl of Carrick, whose grandfather had been the chief competitor for the crown with Baliol, had resided for some years at the English court; but he now, in the beginning of February, 1306, suddenly made his escape to Scotland; and in a few weeks the banner of revolt against the English domination was again unfurled in that country, and the insurgent people gathered around this new leader, who was solemnly crowned at Scone on the 27th March. On receiving this news Edward immediately prepared for a new expedition to Scotland; and sent the Earl of Pembroke forward to encounter Bruce, intending to follow himself as soon as he had completed the necessary arrangements. The army of Bruce was dispersed at Perth on the 19th June by Pembroke, who had thrown himself into that city; and the king of the Scots became for a time a houseless fugitive. But the great enemy of that unfortunate people had now reached the last stage of his destructive career. Edward got no farther than a few miles beyond Carlisle in his last journey to the north. After spending the winter months at Lanercost, where he was detained by a severe illness, he appears to have arrived in that city in the beginning of March, 1307; here he was again taken ill, but his eagerness to advance continued unabated; having somewhat recovered he again set out, although he was still so weak and suffered so much pain that he could accomplish no more than six miles in four days. On the 6th of July he reached the village of Burgh-upon-Sands, 'and there he expired,' to copy the words of Lord Hailes, 'in sight of that country which he had devoted to destruction.' On his death-bed he is said to have enjoined his son and successor to prosecute the design which it was not given to himself to finish: according to Froissart, he made him swear that after his breath had departed from the royal body he would cause it to be boiled in a cauldron till the flesh fell off, and that he would preserve the bones to carry with him against the Scots as often as they should rebel. This oath, however, if it was taken, was not kept. The corpse of King Edward was interred in Westminster Abbey on the 28th of October.

Edward I. was twice married. By his first wife Eleanor, daughter of Ferdinand III., king of Castile and Leon, he had four sons: John and Henry, who both died in infancy while their father was in the Holy Land; Alphonso, born at Maion in Gascony, 23rd November, 1273, who died at Windsor, 4th August, 1285; and Edward, who succeeded him. He had also by Eleanor nine daughters: Eleanor, born in 1266, married to Henry earl of Bar; Joanna of Acre, born in that town in 1272, married first to Gilbert de Clare, earl of Gloucester and Hereford, and secondly to Sir Ralph Monthermer; Margaret, born 1275, married to John duke of Brabant; Berengera, born in 1276; Alice; Mary, born 22nd April, 1279, who at ten years of age took the veil in the monastery of Ambresbury; Elizabeth, born in 1282, married first, to John earl of Holland and Zealand, secondly, to Humphrey Bohun earl of Hereford and Essex; Beatrice; and Blanch. Queen Eleanor died 28th November, 1290, at Grantham, or, according to another account, at Hardeby, in Lincolnshire: her body was brought to Westminster Abbey to be interred, and crosses were afterwards erected on the several spots where it rested on the way, namely, at Lincoln, Grantham, Stamford, Geddington, Northampton (near which town one exists), Stoney Stratford, Dunstable, St. Albans, Waltham, (where the cross, a very beautiful one, still stands, and has been lately restored,) and Charing, then a village near London, but now the centre of the metropolis, under the name of Charing Cross. Edward's second wife was Margaret, eldest daughter of Philip III., and sister of Philip IV., kings of France. He was married to her on the 10th of September, 1299, she being then in her eighteenth year. By Queen Margaret he had two sons: Thomas, born at Brotherton in Yorkshire, 1st June, 1300, afterwards created earl of Norfolk and earl marshal; and Edmund, born 5th August, 1301, afterwards created earl of Kent; and one daughter, Eleanor, born at Winchester, 6th May, 1306, who died in her childhood. Queen Margaret died in 1317.

The rapid narrative that has been given of the acts of his reign sufficiently indicates the main constituents of the character of this king. He had his full share of the ability and the daring of the vigorous line from which he was sprung; a line that (including himself) had now given nine kings to England, and only two of them not men of extraordinary force of character. With all his ambition and stern determination, however, Edward neither loved bloodshed for itself, nor was he a professed or systematic despiser of the rules of right and justice. It is probable that in his persevering contest with the Scots he believed that he was only enforcing the just claims of his crown; and his conduct, therefore, ferocious and vindictive as in many respects it was, may be vindicated from the charge of want of principle, if tried by the current opinions and sentiments of his age. Putting aside considerations of morality, we perceive in him an ample endowment of many of the qualities that most conduce to eminence—activity, decision, foresight, inflexibility, perseverance, military skill, personal courage and power of endurance; and, united with boldness in conceiving and executing his designs, great patience and sagacity in preparing and managing his instruments, and bending circumstances to his will. Engaged as he was during the greater part of his reign in war, he was not advantageously placed for the full application of his talents in the business of civil government; but his reign is notwithstanding one of the most remarkable in our history, for the progress which was made in it towards the settlement of the laws and the constitution. On this account Edward I. has often been styled (though, as is obvious to any one who knows what Justinian's legislation was, not with any propriety) the English Justinian; and Sir Matthew Hale (*Hist. of the Common Law of England*, chap. 7) has remarked that more was done in the first thirteen years of his reign to settle and establish the distributive justice of the kingdom than in all the next four centuries. Blackstone has enumerated under fifteen heads the principal alterations and improvements which the law underwent in the reign of Edward I.: we can only here notice the confirmation and final establishment of the two great charters; the definition and limitation of the bounds of ecclesiastical jurisdiction; the ascertainment and distribution of the powers and functions both of the supreme and the inferior courts; the abolition of the practice of issuing royal mandates in private causes; the establishment of a repository for the public records of the kingdom, 'few of which,' as Blackstone remarks, 'are antienter than the reign of his father, and those were by him collected;' the improvement of the law and process for the recovery of debts by the Statutes Merchant and Elegit [Elegit]; and the check imposed on the encroachments of the church by the passing of several statutes of mortmain. The object of the statute De Donis was to render lands which were the subject of this particular form of grant inalienable, and so far to put restraints upon the disposal of landed property, which however were soon evaded. [Condition; Estate.] 'Upon the whole, we may observe,' concludes Blackstone after Hale, 'that the very scheme and model of the administration of common justice between party and party was entirely settled by this king.' The forms of writs by which actions are commenced, it is added, were perfected in this reign. While the English laws were fully extended to Ireland and Wales, it was under Edward I., also, that the foundations of the constitution of the kingdom may be considered to have been laid by the new form and the new powers which were then assumed by the parliament. The earliest writs that have been preserved for summoning knights, citizens, and burgesses to parliament, are, as is well known, those that were issued by Simon de Montfort, earl of Leicester, the leader of the barons, in 1264, in the name of king Henry III., who was then a prisoner in his hands. Whether this representation of the commons was then first introduced or not, it was in the course of the succeeding reign that it first became regular and influential. The division of the legislature into two houses, in other words the institution of our present House of Commons, appears to be clearly traceable to the time of Edward I. It was in his time also that the practice began fairly to take root of the king refraining from arbitrary exactions and coming to parliament for supplies, and that the earliest effective examples were afforded of the grant of supplies by that assembly being made dependent upon the redress of grievances. Edward I., with all his military habits and genius, had at length the good sense to perceive that the time was come for abandoning the attempt to govern by the prerogative alone, which had been clung to by all his predecessors from the conquest: in his disputes with the barons he never allowed matters to come to a contest of force, as his father and grandfather had done; and in the latter part of his reign, although more than once compelled to stop short in his most favourite designs by the refusal of the national representatives to furnish him with the necessary means, he seems to have kept to the system of never resorting to any other weapons than policy and management to overcome the opposition with which he was thus thwarted. It was in the last year but one of this reign that the royal assent was given to the famous enactment commonly called the 'Statute de Tallagio non Concedendo,' by which the right of taxation was first distinctly affirmed to reside in the parliament: 'no tallage or aid,' the first chapter runs (in the old English translation), 'shall be levied by us or our heirs in our realm, without the good will and assent of Archbishops, Bishops, Earls, Barons, Knights, Burgesses, and other Freemen of the land.' The same principle had been conceded ten years before (by the 25th Edward I., c. 6), but not in such explicit terms.

The trade and foreign commerce of England appear to have advanced considerably during the reign of Edward I.; but rather owing to the natural progress of the civilization of this country and of Europe, than from any enlightened attention which the king showed to these interests. He seems to have been principally solicitous to turn the increasing intercourse of the country with foreign parts to his own particular profit by the increase of the customs. A few of his laws, however, were beneficial to the trading community, and were made with this express object, especially the act for the better recovery of debts, commonly called the Statute of Merchants, passed at Acton-Burnell in 1283; and the extension of the same by a subsequent act; and the Elegit above mentioned. On the other hand, he lowered, though slightly, the real value of the coin, thereby setting the first example of a most pernicious process, which was afterwards carried much farther. He also cruelly pillaged and oppressed the Jews; and finally, in 1290, expelled the entire body of that people from England, and seized all their houses and tenements. Before this (in 1275) a law had been passed prohibiting the Jews from taking interest for money on pain of death.

The most distinguished names in literature and science that belong to the reign of Edward I. are Duns Scotus, his disciple William Occam, and the illustrious Roger Bacon. Among the historical writers or chroniclers who flourished at this time, may be mentioned Thomas Wikes, Nicholas Trivet, Walter de Hemmingford, and, according to one account, Matthew of Westminster, though he is placed by some considerably later. The law writers of this reign are the author of the work entitled Fleta, Britton (if that be not a corruption of Bracton), Hengham, and Gilbert de Thornton, chief justice of the King's Bench, the author of an abridgment of Bracton, which has not been printed.

EDWARD II., the eldest surviving son of Edward I was born at Caernarvon 25th April, 1284, and became the heir apparent to the crown by the death of his elder brother, Alphonso, a few months after. In 1289 he was affianced to the young queen of Scotland, who died the following year. On the 1st of August, 1297, his father, being about setting out for Flanders, assembled a great council at London, and made the nobility swear fealty to the prince, whom he then appointed regent of the kingdom during his absence. The parliament in which the first statute De Tallagio non concedendo received the royal assent was held at Westminster by prince Edward a few months after his father's departure. In the summer of 1300 we find him accompanying his father in a military expedition to Scotland, and he is particularly mentioned as leading one of the divisions of the army, called the Shining Battalion, in an encounter with the Scottish forces on the banks of the river Irvine. As he grew towards manhood, however, he appears to have begun to form those vicious associations which were the chief source of the calamities of his life. It is recorded by Stow and Fabyan that in October of the same year the notorious Piers Gaveston was banished by the king from about the person of prince Edward, who, through his persuasion, had been guilty of several outrages against the bishop of Lichfield, and the prince himself was ordered to prison for stealing the bishop's deer. Gaveston was the son of a knight of Gascony, and is admitted to have been distinguished by his wit and accomplishments as well as by his personal advantages, but he is affirmed to have, as the prince's minion, carried himself to men of all ranks with unbearable insolence. In 1301 Edward was created Prince of Wales and Earl of Chester. He was again in Scotland with his father in the expedition in the summer of 1303: while the king proceeded along the east coast, the prince marched westward, and the latter afterwards wintered in Perth, while his father remained in Dunfermline. When Edward was preparing for his last Scottish expedition after the insurrection under Robert Bruce, he knighted his eldest son at Westminster on the morrow of Whitsuntide, 1306; after which the prince bestowed the same honour on three hundred gentlemen, his intimate companions in arms. He was at the same time invested by his father with the duchy of Guienne. The royal banquet that was given on this occasion is celebrated for what is called the Vow of the Swans, an oath taken by the king to God and to two swans, which were brought in and set upon the table, that he would take vengeance on Robert Bruce and punish the treachery of the Scots. The prince also vowed that he would not remain two nights in the same place until he reached Scotland. He set out accordingly before his father, and as soon as he had crossed the border he began to signalize his march by such unsparing devastation that even the old king is said to have reproved him for his cruelty. While king Edward was at Lanercost in February, 1307, he found it necessary, with the consent of the parliament there assembled, to issue an order banishing Gaveston for ever from the kingdom, as a corrupter of the prince. It is doubtful, notwithstanding the story told by Froissart [Edward I.] if the prince of Wales was with his father when he died on the 7th of July following; but he was at any rate at no great distance, and he was immediately recognized as king. His reign appears to have been reckoned from the day following.

The new king obeyed his father's injunctions to prosecute the war with Scotland, by proceeding on his march into that country as far as Cumnock, in Ayrshire. But here he turned round without having done anything, and made his way back to England. Meanwhile his weak mind seems to have been occupied only with one object the advancement of the favourite. A few dates will best show the violence of his infatuation. His first recorded act of government was to confer upon Gaveston, now recalled to England, the earldom of Cornwall, a dignity which had hitherto been held only by princes of the blood, and had a few years before reverted to the crown by the death, without issue, of Edmund Plantagenet, the late king's cousin: the grant, bestowing all the lands of the earldom as well as the dignity, is dated at Dumfries the 6th of August, 1307. About the same time Walter de Langton, bishop of Lichfield, who was lord high treasurer, was imprisoned in Wallingford castle, as having been the principal promoter of Gaveston's banishment. In October the new earl of Cornwall married the king's niece, Margaret de Clare, the daughter of his sister, Joanna, countess of Gloucester. He was also made guardian during his minority to her brother, the young earl. The grant of several other lordships followed immediately, and it is even said that the reckless prodigality of the weak king went the length of making over all the treasure his father had collected for the Scottish war, amounting to nearly a hundred thousand pounds, to the object of his insane attachment. Finally, he left him guardian of the realm while he set out for Boulogne in January, 1308, to marry Isabella, the daughter of the French king, Philip V., to whom he had been affianced ever since the treaty concluded between Philip and his father in 1299. The marriage took place on the 25th of January, and on the 25th of February the king and queen were crowned at Westminster.

The history of the kingdom for the next five years is only that of a long struggle between the king and his disgusted nobility about this Gaveston. The banishment of the favourite being insisted upon by a formidable league of the barons, Edward was obliged to give in; but instead of being ignominiously sent out of the country, Gaveston was merely appointed to the government of Ireland. In June the royal master accompanied him as far as Bristol on his way to that country. Even from this honourable exile, however, he returned in October following. The barons immediately again remonstrated, and in March, 1310, the king found himself compelled to sign a commission by which he resigned the government of the kingdom for the ensuing year into the hands of a committee appointed by the parliament. A sentence of banishment was soon after passed upon Gaveston, and he retired to France; but by the close of the year 1311 we find him again in England. The earl of Lancaster, the king's cousin, now placed himself at the head of the malcontents: finding petitions and remonstrances unattended to, he and his associates at length rose up in arms. Gaveston was besieged in Scarborough castle, and having been forced to surrender, his career was ended by his summary execution at Warwick on the 19th of June, 1312. Having thus attained their main object, the insurgent barons made their submission to the king, and a peace was finally concluded between the parties in December.

In the course of the last two or three years Robert Bruce, left unmolested in Scotland, had not only nearly recovered every place of strength in that country, but had been emboldened to make an annual plundering inroad across the borders. It was now determined to take advantage of the cessation of domestic dissensions to effect the reconquest of the northern kingdom; and in June, 1314, Edward set out for that purpose at the head of the most numerous force that had ever been raised in England. The issue of the expedition was the signal defeat sustained at the battle of Bannockburn, fought the 24th of June, at which the magnificent host of the English king was completely scattered, he himself narrowly escaping captivity. After this the few remaining fortresses in Scotland that were still held by English garrisons speedily fell into the hands of Bruce; the predatory and devastating incursions of the Scots into England were renewed with more audacity than ever; and Bruce and his brother Edward even made a descent upon Ireland, and for some time contested the dominion of that island with its English masters. At length, in September, 1319, a truce for two years with the Scots was arranged with difficulty. Nor was it long observed by the party most interested in breaking it. The Scots easily found pretexts on which to renew their attacks, and Edward's efforts to check them proved as impotent as before.

Meanwhile, a new favourite began to engross him, Hugh le Despencer, the son of a nobleman of the same name. Upon him Edward now bestowed another daughter of his sister, the countess of Gloucester, in marriage, and many large possessions. Another armed insurrection of the barons was the consequence; and in July, 1321, the Despencers, father and son, were both banished by act of parliament. Before the end of the same year, however, they were recalled by the king; and now for a short time the fortune of the contest changed. The earl of Lancaster was taken and beheaded at Pontefract, 22nd March, 1322; and the sentence against the Despencers was soon after formally revoked by parliament. About twenty of the leaders of the insurrection in all were put to death; but the estates of many more were forfeited, and most of the immense amount of plunder thus obtained by the crown was at once bestowed upon the younger Spencer. Edward imagining that he had now an opportunity of which he might take advantage, set out once more for the conquest of Scotland in August, 1322; but after advancing as far as Culross, in Fife, he returned without having accomplished anything more than the destruction of a few religious houses; and on the 30th of March, 1323, he concluded another truce with the Scots, to last for thirteen years.

New storms, however, were already rising against the unhappy king. Charles IV., called the Fair, the youngest brother of Edward's queen, had recently succeeded to the French throne, and had begun his reign by quarrelling on some pretence with his brother-in-law, and seizing Guienne and Edward's other territories in France. After some other attempts at negotiation, it was resolved that queen Isabella should herself go over to France to endeavour to bring about an arrangement. The queen had been already excited against the Despencers; she had long probably despised a husband who was the object of such general contempt, and who besides openly preferred his male favourites to her society. At the French court she found collected many English nobles and other persons of distinction, whom their dissatisfaction with the state of affairs, or the enmity of the Despencers, had driven from their country. All these circumstances considered, it is easy to understand how she might naturally become the centre and head of a combination formed by the discontented exiles among whom she was thrown, and their connexions still in England, for the professed object of compelling her husband to change his system of government and of removing the pernicious power that stood between the nation and the throne. Among the foremost figures of the association with which she thus became surrounded was the young Roger de Mortimer, a powerful baron, who had made his escape from England after having been condemned, for taking part in the former confederacy against the Despencers, to imprisonment for life. There is no doubt that the connexion between Queen Isabella and Mortimer became eventually a criminal one. The plot against the king was begun by the conspirators contriving to get the heir-apparent, Prince Edward, into their power. It was arranged that King Charles should restore Guienne upon receiving from the prince the homage which his father had refused to render. On this Prince Edward, now in his thirteenth year, was sent over to France to his mother. The first use Isabella made of this important acquisition was to affiance the boy to Philippa, the daughter of the earl of Hainault, who in return agreed to assist her and the confederates with troops and money. Thus supported, she set sail from Dort with a force of 3000 men, under the command of the earl's brother, and landed at Orwell in Suffolk, the 22nd of September, 1326. She was immediately joined by all the most distinguished persons in the kingdom, including even the earl of Kent, the king's own brother. Edward, deserted by all except the two Despencers and a few of their creatures, left London, and took refuge at first in Bristol; he then embarked for Ireland, or, as another account says, with the design of making for the small isle of Lundy, at the mouth of the Bristol Channel; but being driven back by contrary winds, he landed again in Wales, and shut himself up in Neath Abbey, in Glamorganshire. Meanwhile, the queen's forces attacked the castle of Bristol, where the elder Despencer, styled earl of Winchester, had been left governor by the king. When the siege had lasted only a few days, the garrison rose in mutiny and delivered up the old man. He was ninety years of age; but his grey hairs did not save him; he was immediately executed with every circumstance of barbarous insult the ingenuity of his captors could devise. The next day (28th

October) the prelates and barons in the queen's camp declared Prince Edward guardian of the kingdom. The king was discovered in his place of concealment about three weeks after, and was conducted in custody first to the castle of Monmouth, and then to that of Kenilworth. The younger Despencer was also taken; he was hanged and quartered at Hereford on the 24th of November. The parliament assembled on the 1st of January, 1327; and after going through some forms of negotiation with the imprisoned king, it was resolved, on the 25th of that month, that the crown should be taken from him and conferred upon his son Prince Edward. A deputation announced this resolution to the deposed monarch. He remained for some months longer at Kenilworth: he was then transferred successively to Corfe, Bristol, and Berkeley Castles. At length, when it was found that mere insult would not kill him, he was, on the night of the 20th of September, murdered in the last-mentioned place by his keepers Sir Thomas Gournay and Sir John Maltravers, who with detestable brutality thrust a red-hot iron into his bowels through a pipe, thus contriving to destroy him without leaving any external marks of their atrocious operation.

Edward II. left by his Queen, Isabella of France, two sons, Edward, who succeeded him, and John, born at Eltham 15th August, 1316, created earl of Cornwall, in 1327, who died at Perth in October, 1336; and two daughters, Joanna, married 12th July, 1328, to Prince David, eldest son of Robert Bruce, afterwards King David II. of Scotland, and Eleanor, who became the wife of Reginald Count of Guelders.

Some attempts have been made in modern times to dispute the justice of the character which has been generally given of this king, and to throw the blame of the civil distractions which rendered his reign so unhappy and so ignominious a one, rather upon his turbulent nobility than himself. Hume, whose good nature and indolent generosity of feeling inclined him in this as well as in other cases to side with the unsuccessful party, while his quiet temper made him also constitutionally averse to that revolt against established authority and those other irregular proceedings with which the barons are chargeable in their contest with Edward II., has written the history of the reign with a studied endeavour to put the former in the wrong throughout, and to represent Edward as the victim, not of his own weaknesses and vices, but rather of the barbarism of the age. The facts, however, on which the common verdict rests cannot be thus explained away. It may be admitted that among the motives which excited and sustained the several confederacies against the king, and in the conduct of some of those who took the lead in them, there was violence and want of principle enough; it is of the nature of things that the baser passions should mix themselves up and even act an important part in all such conflicts, however righteous in their origin and general object; but nothing that can be alleged on this head can affect the question of Edward's unfitness to wear the crown. That question must be considered as settled, if not by the course of outrage against all decency manifested by his conduct in the matter of Gaveston, certainly by his relapse into the same fatal fatuity a few years after, when he fell into the hands of his second favourite Despencer. Hume has spoken of the acts of maladministration objected to the king and his minions as 'of a nature more proper to excite heart-burnings in a ball or assembly than commotions in a great kingdom.' The admitted fact of the universal indignation which the acts in question did excite is a sufficient answer to this statement of the case.

To the reign of Edward II. belongs the memorable event of the suppression in England, as in the other countries of Europe, of the great order of the Knights-Templars. Their property was seized all over England in 1308; but the suppression of the order in this country was not accompanied by any of that cruel treatment of the persons of the members which they experienced in France. In 1324 the lands which had belonged to the Templars were bestowed upon the order of St. John of Jerusalem.

The most important legal innovation of this reign was that made by the statute of sheriffs (9 Edward II., st. 2), by which the right of appointing those officers was taken from the people and committed to the chancellor, the treasurer, and the judges. Several of the royal prerogatives, relating principally to tenures, were also defined by the [illegible] entitled 'Prerogativa Regis' (17 Edward II., st. 1). The statutes down to the end of the reign of Edward II. are commonly distinguished as the 'Vetera Statuta.' Pleading now began to assume a scientific form. The series of year-books, or reports by authority of adjudged cases, is nearly perfect from the commencement of this reign. The only law treatise belonging, or supposed to belong, to the reign of Edward II. is Horne's *Miroir des Justices*.

The circumstances of the reign were as little favourable to literature as to commerce and the arts. Warton observes that though much poetry now began to be written, he has found only one English poet of the period whose name has descended to posterity; Adam Davy or Davie, the author of various poems of a religious cast, which have never been printed. Among these, however, is not to be reckoned the long work entitled 'The Life of Alexander,' which is erroneously attributed to him by Warton, but which has now been conclusively shown not to be his. It is printed for the first time in Weber's Metrical Romances. There is also extant a curious Latin poem on the battle of Bannockburn, written in rhyming hexameters by Robert Baston, a Carmelite friar, whom Edward carried along with him to celebrate his anticipated victory, but who, being taken prisoner, was compelled by the Scotch to sing the defeat of his countrymen in this jingling effusion. Bale speaks of this Baston as a writer of tragedies and comedies, some of which appear to have been English; but none of them are now known to exist.

EDWARD III., king of England, the eldest son of Edward II. and Isabella of France, was born at Windsor (whence he took his surname), 13th November, 1312. In the first negotiations with the court of France after the breaking out of the quarrel about Guienne in 1324, a proposal seems to have been made by the French king, Charles IV., for a marriage between a daughter of his uncle, the count de Valois, and the young prince of Wales, as Edward was styled; but it was coolly received by the king of England, and ended in nothing. In September of the year following Prince Edward proceeded to Paris, where his mother now was, and did homage to his uncle, king Charles, for the duchy of Guienne and the earldom of Ponthieu, which his father had previously resigned to him. He was induced by his mother to remain with her at the French court, notwithstanding the most pressing letters from his father (Rymer, iv.), begging and commanding him to return. Meanwhile Isabella, having previously solicited from the pope a dispensation (which however she did not obtain) to permit her to marry her son without his father's knowledge, had arranged a compact with William earl of Hainault, by which the prince was affianced to Philippa, the second of the earl's four daughters. Edward was soon after carried by his mother to Valenciennes, the residence of the earl of Hainault, where he met Philippa, and, it is said, fell ardently in love with her. He landed with his mother in England in September, 1326; was declared guardian and regent of the kingdom about a month after; and was proclaimed king on the deposition of his father, 25th January, 1327. [EDWARD II.] He was crowned at Westminster the following day.

The government of the kingdom during the king's minority was placed by the parliament in the hands of a regency, consisting of twelve noblemen and bishops, with Henry earl of Lancaster (the brother of Thomas, executed in the preceding reign) at their head. The queen however and Mortimer (now created earl of March) from the first assumed the chief management of affairs, and soon monopolized all power. They must be considered as having been the real authors of the murder of the deposed king. Their authority seemed for the moment to be rather strengthened than otherwise by the failure of a confederacy formed among the nobility to effect their overthrow in the winter of 1328-9. In March, 1329, signal proof was given of their determination and daring in the maintenance of their position, by the fate of the king's uncle, the earl of Kent, who having become involved in what was construed to be a plot against the government, was put to death on that charge.

Meanwhile the king, young as he was, and although thus excluded from the government, had not passed his time in inactivity. He was married to Philippa of Hainault, 24th January, 1328. A few months after his accession he had marched at the head of a numerous army against the Scotch, who had again invaded and ravaged the northern counties; but they eluded all his attempts to come up with them, and after a campaign of three weeks this expeended in nothing. Soon after this a treaty of peace was concluded between the two kingdoms, on the basis of the recognition of the complete independence of Scotland. This important treaty was signed at Edinburgh, the 17th of March, 1328, and confirmed in a parliament held at Northampton on the 4th of May following. One of the articles was, that a marriage should take place between prince David, the only son of the king of Scotland, and the sister of the king of England, the princess Joanna; and, although the bride was only in her seventh, and the bridegroom in his fifth year, the marriage was celebrated accordingly at Berwick on the 12th of July. The illustrious Bruce just lived to see this truly epic consummation of his heroic labours. He was able to receive the youthful pair on their arrival at Edinburgh after the nuptials; but he was now worn out by a disease which had for some time preyed upon him, and he returned immediately to his country-seat at Cardross, where he expired on the 7th of June, 1329.

The settlement of the dispute between the two countries which thus seemed to be effected, proved of very short duration. In a few months a concurrence of important events altogether changed both the domestic condition and the external relations of England. In the close of the year 1330, Edward at length determined to make a bold effort to throw off the government of Mortimer. The necessary arrangements having been made, the earl and the queen-mother were seized in the castle of Nottingham on the 19th of October; the execution of Mortimer followed at London on the 29th of November; many of his adherents were also put to death; Isabella was placed in confinement in her house at Risings (where she was detained for the remaining twenty-seven years of her life); and the king took the government into his own hands. In the course of the following year Edward seems to have formed the design of resuming the grand project of his father and his grandfather—the conquest of Scotland. For this design he found an instrument in Edward Balliol, the son of the late king John, who, in April, 1332, landed with a small force at Kinghorn, in Fife, and succeeded so far, in the disorganized state of the Scottish kingdom under the incompetent regency of the earl of Mar, and by the suddenness and unexpectedness of his attack, as to get himself crowned at Scone on the 24th of September. Edward, on this, immediately came to York; and on the 23rd of November Balliol met him at Roxburgh, and there made a solemn surrender to him of the liberties of Scotland, and acknowledged him as his liege lord. The violation of his late solemn engagements committed by Edward in this affair was rendered still more dishonourable by the caution and elaborate duplicity with which he had masked his design. Only a few weeks after doing his homage, Balliol found himself obliged to fly from his kingdom; he took refuge in England; various military operations followed; but at last Edward advanced into Scotland at the head of a numerous army: on the 19th of July, 1333, a great defeat was sustained by the Scotch at the battle of Halidon Hill, near Berwick; the regent Douglas himself was mortally wounded and taken prisoner; and every thing was once more subjected to Edward Balliol. King David and his queen were conveyed in safety to France. On the 12th of June, 1334, at Newcastle, Balliol, by a solemn instrument, made an absolute surrender to Edward of the greater part of Scotland to the south of the Forth. But within three or four months the puppet king was again compelled to take flight to England. Two invasions of Scotland by Edward followed; the first in November of this year; the second in July, 1335; in the course of which he wasted the country with fire and sword almost to its extreme northern confines, but did not succeed in bringing about an engagement with the native forces, which, notwithstanding, still kept the field. In the summer of 1336 he took his devastating course for the third time through the northern counties, with as little permanent effect. On now retiring to England he left the command to his brother John, styled earl of Cornwall, who soon after died at Perth.

From this time, however, the efforts of the English king were, in great part, drawn off from Scotland by a new object. This was the claim which he had first advanced some years before to the crown of France, but which he only now proceeded seriously to prosecute, determined probably by the more open manner in which the French king had lately begun to exert himself in favour of the Scots, whom, after repeated endeavours to serve them by mediation and intercession, he had at length ventured to assist by supplies of money and warlike stores. Charles IV. of France had died in February, 1328, leaving a daughter who was acknowledged on all hands to have no claim to the crown, which it was agreed did not descend to females. In these circumstances Philip of Valois mounted the throne, taking the title of Philip VI. He was without dispute the next in the line of the succession if both females and the descendants of females were to be excluded. Edward's claim rested on the position that although his mother, Isabella, as a female, was herself excluded, he, as her son, was not. If this position had been assented to he would undoubtedly have had a better claim than Philip, who was only descended from the younger brother of Isabella's father. But the principle assumed was, we believe, altogether new and unheard of—and would besides, if it had been admitted, have excluded both Philip and Edward, seeing that the true heir in that case would have been the son of Joanna Countess d'Evreux, who was the daughter of Louis X., Isabella's brother. It would also have followed that the two last kings, Philip V. and Charles IV., must have been usurpers as well as Philip VI.; the son of Joanna, the daughter of their predecessor and elder brother, would, upon the scheme of succession alleged by the king of England, have come in before both. Undeterred by these considerations, however, or even by the circumstance that he had himself in the first instance acknowledged Philip's title, and even done homage to him for the Duchy of Guienne, Edward, having first entered into an alliance with the earl of Brabant, and taken other measures with the view of supporting his pretensions, made an open declaration of them, and prepared to vindicate them by the sword. The earliest formal announcement of his determination to enforce his claim appears to have been made in a commission which he gave to the earl of Brabant and others to demand the crown of France and to take possession of it in his name, dated 7th October, 1337.

We cannot here pursue in detail the progress of the long war that followed. Edward embarked for the continent on the 16th July, 1338, and arrived at Antwerp on the 22nd. Of his allies the chief were the emperor and the free towns of Flanders, under nominal subjection to their earl, but at this time actually governed by the celebrated James Van Arteveldt. The emperor made him his vicar, and at Arteveldt's suggestion he assumed the title of king of France. The first important action that took place was the sea-fight off Sluys, on the 22nd June, 1340, in which the English were completely victorious. It was followed by long truces, which protracted the contest without any decisive events. Meanwhile, in Scotland, the war proceeded, also with occasional intermissions, but on the whole to the advantage of the national cause. Balliol left the country about the close of 1338; and in May, 1341, King David and his consort Joanna returned from France. In 1342 the Scots even made several inroads into the northern counties of England. A suspension of hostilities however took place soon after this, which lasted till the close of 1344.

In 1345 Edward lost the services of his efficient ally Van Arteveldt, who was murdered in an insurrection of the populace of Ghent, excited by an attempt, which he appears to have made somewhat too precipitately, to induce the free towns to cast off their sovereign, the earl of Flanders, and to place themselves under the dominion of the son of the king of England, Edward, prince of Wales. Edward, afterwards so distinguished under the name of the Black Prince (given to him from the colour of his armour), was born at Woodstock, 15th June, 1330, and was consequently only yet in his sixteenth year. His father nevertheless took him along with him to win his spurs, when in July, 1346, he set out on another expedition to France with the greatest army he had yet raised. After reducing Caen and Lower Normandy, he proceeded along the left bank of the Seine till he reached the suburbs of the capital, and burnt the villages of St. Germains and St. Cloud. The memorable battle of Crecy followed on the 26th of August, in which the main division of the English army was commanded by the prince. Between thirty and forty thousand of the French are said to have been slain in this terrible defeat. Among those who fell was John of Luxemburg, king of Bohemia; he fell by the hand of Prince Edward, who thence assumed his armorial ensign of three ostrich feathers and the motto *Ich Dien* (I serve), and transmitted the badge to all succeeding princes of Wales.

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[illegible] A [illegible] the [illegible] for the [illegible] his [illegible] to [illegible] even his [illegible] resigned [illegible] from his [illegible] murdered [illegible] had [illegible] Edward [illegible] been [illegible] to support [illegible] his subjects [illegible] troops [illegible] to [illegible] the [illegible] lands [illegible] forthwith [illegible] the [illegible] Prince Edward [illegible] but [illegible] an illness [illegible] gradually [illegible] pelled him [illegible] had just before [illegible] six years old [illegible] had died on the [illegible]

On his departure from Guienne, Prince E[illegible] government of the principality [illegible] John of Gaunt, duke of Lancaster [illegible] after married a daughter of Peter, the Cruel [illegible] he assumed the title of king of Castile [illegible] of the year followed his brother to E[illegible] the continent now went rapidly [illegible] great French General Duguesclin [illegible] where before him. In the [illegible] were fitted out from England [illegible] earl of Pembroke, the second [illegible] accompanied by the Black Prince [illegible] failed. The forces of the earl of P[illegible] while attempting to land at Rochelle [illegible] King of Castile: and those [illegible] son, which were embarked in [illegible] *for six weeks, were prevented* [illegible] *winds, and obliged to put back to E*[illegible] *1374, when he had lost everything* [illegible] *to him by the treaty of Bretigny.* [illegible] *a truce for three years.*

This ended the French wars of [illegible] *England so much blood and treasure* [illegible] *against Scotland equally* [illegible] *David II had died in February, 1371,* [illegible] *Scotland immediately ascended the throne* [illegible] *under the title of Robert II.* [illegible] *by Edward to disturb this* [illegible] *he at one time seemed inclined to* [illegible] *he never* [illegible] *Robert* [illegible] *he contented himself with* [illegible] *of Scotland.* *The* [illegible] *Edward's long reign* [illegible]

d, on the 8th of June 1376. He was in
tion the first hero of the age, and in this
tary skill, his valour, and other brilliant
, may be admitted to have entitled him;
ects, he was not superior to his age, nor
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ome one son, Richard, a child in his
appears also to have had a daughter,
fe of Waleran de Luxemburg, count de
ate sons were Sir John Sounder and
sion. King Edward, in the weak
d, now for some time given up the
of affairs to his second son the am-
caster, and fears were entertained that
to inherit the crown; but these appre-
ed by his creating Richard of Bordeaux
e of Cornwall, and earl of Chester, and
liament his heir and successor. Since
ow also he had attached himself with
Alice Perrers, one of the Ladies of her
at excited great public disgust by the
ubtly ruled him. The last fortnight
his manor of Sheen, now Richmond,
lady. But even she deserted him on
eath; and no one save a single priest
or even in the house, when he breathed
happened on the 21st of June, 1377, in
age and the 51st of his reign.
by his queen, Philippa of Hainault,
ward prince of Wales; 2. William of
who died young; 3. Lionel, duke of
twerp 29th November, 1338; 4. John,
alled of Gaunt, or Ghent, where he was
mund, duke of York, born at Langley,
1341; 6. William born at Windsor, who
omas, duke of Gloucester, born at
tary, 1355; and five daughters: 1. Isa-
guerrand de Coucy, earl of Soissons and
n, born in August, 1335, who was con-
Pedro the Cruel, afterwards king of Cas-
e plague at Bordeaux, in 1349, before
Blanche, called De la Tour, from having
ower of London, who died in infancy;
o John de Montford, duke of Bretagne;
narried to John de Hastings, earl of Pem-

erved, in regard to Edward III., by Sir
h, that 'though his victories left few
ts, yet they surrounded the name of his
stige which produced strength and safety;
hat gave a loftier tone to the feelings of
more vigorous activity to her faculties.'
of fifty years,' it is added, 'Edward III.
mmons, which are extant to this day, to
parliaments or great councils: he thus
h and passions of the parliament and the
y in support of his projects of aggrandise-
y became his zealous and enthusiastic fol-
mbition was caught by the nation, and men
t station became proud of his brilliant victo-
and keep up the state of public temper was
y of his domestic administration, and satis-
the internal tranquillity of England du-
years of his effective reign. It was the natu-
ion of so long and watchful a pursuit of popula-
ed grievances were redressed as soon as felt,
entary authority was yearly strengthened by
t that the minds of the turbulent barons were
turned towards a share in their sovereign's glory.
ome was partly the fruit of fame abroad.'
great charters were repeatedly confirmed in this
, a greater number of important new laws were
n in all the preceding reigns since the Conquest.
hem, may be particularly noticed the celebrated
Ed. III., st. 5, c. 2) defining and limiting the
of high treason; the numerous provisions made to
the royal prerogative of purveyance, and diminish
ances occasioned by it; the law (1 Ed. III., c. 12)
ing tenants in chief to alienate their lands on pay-
f a reasonable fine; the several prohibitions against
yment of *Peter's Pence*; and the first statute (the
Ed. III., st. 1, c. 1) giving a writ of praemunire against
g abroad processes to cite any of the king's subjects to
the court of Rome. In this reign also began the legislation respecting the poor, by the enactment of the statute of Labourers (23 Ed. III. c. 1), which was followed by several other acts of the same kind, setting a price upon labour as well as upon provisions. Trial by Jury also now began to acquire a decided ascendancy over the old modes of trial, and various regulations were made for improving the procedure of the courts and the administration of justice. Justices (at first called keepers) of the peace were established by the statute 34 Ed. III., c. 1. In 1362 was passed the important act (36 Ed. III., st. 1, c. 15) declaring that henceforth 'all pleas should be pleaded, showed, defended, answered, debated, and judged in the English tongue,' and no longer in the French, which is described as 'much unknown in the realm.' They were ordered still however to be entered and enrolled in Latin. The acts of parliament continued to be written sometimes in Latin, but most generally in French, long after this time. The science of legal pleading is considered by Coke to have been brought to perfection in this reign. The only law treatises which belong to this reign are those entitled the Old Tenures, the Old Natura Brevium, the Novæ Narrationes, and the book on the Diversity of Courts. They are all in Norman French.

The commerce and manufactures of the country made some advances with the general progress of the age in the course of this reign; but they certainly were not considerable for so long a space of time. The woollen manufacture was introduced from the Netherlands, and firmly rooted in England before the close of the reign. Some augmentation also seems to have taken place in the shipping and exports of the country. On the other hand, the king's incessant wars operated in various ways to the discouragement of commerce. Sometimes foreign merchants were afraid to send their vessels to sea lest they should be captured by some of the belligerents. On one occasion at least (in 1337), Edward made a general seizure of the property belonging to foreign merchants within his dominions, to supply his necessities. At other times he resorted to the ruinous expedient of debasing the coin. Many acts were passed by the parliament on the subject of trade, but they involved for the most part the falsest principles; some prohibiting the exportation of money, of wool, and of other articles; others imposing penalties for forestalling; others attempting to regulate wages, prices, and expenditure. Of course such laws could not be executed; they only tormented the people, and aggravated the mischiefs they were intended to cure; but in consequence of being thus inefficient, they were constantly renewed. The most memorable invention of this age is that of gunpowder, or rather its application in war. It appears to be certain that cannons were used at the battle of Crecy in 1346; but there is reason to believe that they were in use about twenty years earlier. They were certainly familiarly known before the close of the reign.

Among the more elegant arts, architecture was that which was carried to the greatest height. Edward III. nearly rebuilt the Castle of Windsor, which however has undergone great improvements and alterations since his time: the beautiful chapel of St. George, at Windsor, was also built, or at least finished, by this king. But splendour and luxury generally made undoubtedly great advances among the wealthier classes, although it may be questioned if wealth was more generally diffused throughout the community, or if the poverty and wretchedness of the great body of the people were not rather increased than diminished. The increase of licentiousness of manners among the higher ranks appears to have kept pace with that of magnificence in their mode of living. This was the age of tournaments, and of the most complete ascendancy of the system of chivalry; but all this, at least in its direct and immediate effects, was more favourable to the improvement of the outside polish and formal courtesies of life within a narrow circle, than to the diffusion of any humanizing influences throughout the mass of society. The Order of the Garter was instituted by Edward III., it is generally supposed in the year 1349.

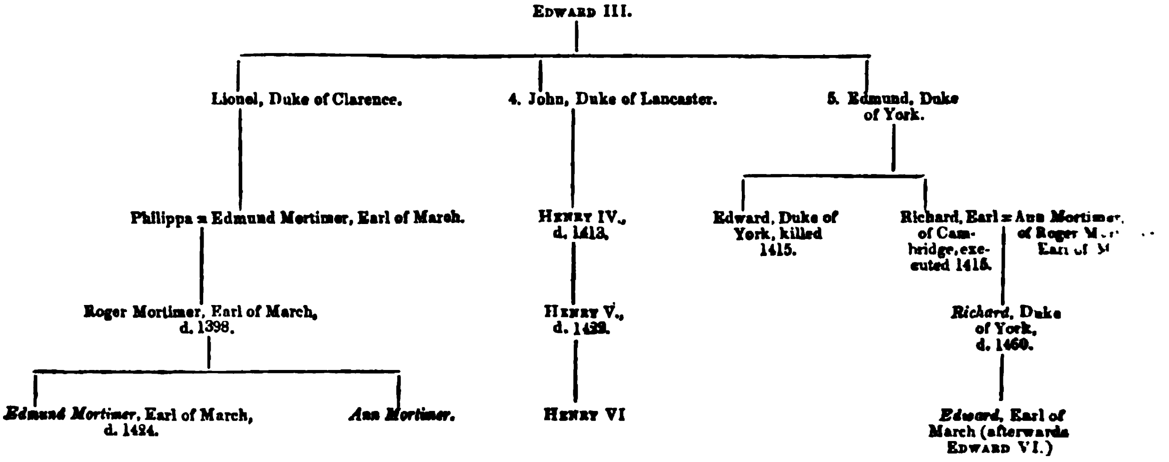
In literature, this was the age of Chaucer, the Morning Star of our poetry, and of his friend Gower, and also of Wicliffe, who first translated the Scriptures into English, and who has been called the Morning Star of the Reformation. The principal chroniclers of the time of Edward III. are Thomas Stubbs, William Thorn, Ralph

Higden, Adam Mermuth, Henry de Knighton, and Robert de Avesbury.

The convulsion in the church excited by Wicliffe began in the last years of Edward III., but the history of it more properly belongs to the next reign, that of his grandson Richard II.

EDWARD IV., king of England. During the reign of Richard II. the heir presumptive to the crown was Roger Mortimer, earl of March, the son of Philippa Plantagenet, who was the only child of Lionel duke of Clarence, the second of the sons of Edward III. that left any descendants. Roger earl of March died in Ireland, where he was lord-lieutenant, or governor, in 1398. His son Edmund Mortimer, earl of March, was a child of only ten years of age at the deposition of Richard II. in 1399; but in his person resided the right to the crown by lineal descent so long as he lived. Although however his name was mentioned on several occasions in connexion with his dangerous pretensions, and he more than once ran the risk of being made a tool of in the hands of persons more ambitious than himself, he never made any attempt against the house of Lancaster. We may here remark, that much confusion has been introduced into the common accounts of Edmund Mortimer by his being confounded with his uncle Sir Edmund Mortimer. It was the latter personage, for instance, who, having married the daughter of Owen Glendower, engaged with the Percies in their insurrection in 1403, and performed the rest of the part assigned to the Lord Mortimer in Shakspeare's play of the First Part of Henry the Fourth. It is to him also we suppose that we are to attribute the pun put by the common histories into the mouth of his nephew the earl of March at the coronation of Henry IV., when, on that king claiming the crown as the heir male of Henry III., he said that he was indeed *Hæres Malus*. 'But Edmund had his jest and Henry his crown,' observes Bishop Kennet in telling this story (*Complete History of England*, i. 274). The young earl of March, with the other children of his father, was detained in a sort of imprisonment at Windsor during all the reign of Henry IV., but on the accession of Henry V. he was set at liberty. In 1415 he became involved in the conspiracy planned against Henry V. by Richard earl of Cambridge; but it is most probable that he was not answerable for the use which was made, or rather intended to be made, on this occasion, of his name. Indeed the common account makes him to have been the person who gave Henry information of the conspiracy, after he had been applied to by the earl of Cambridge, who had married his sister, to join it. After the accession of Henry VI. he was sent as lord lieutenant to Ireland; and he died there in the castle of Trim in 1424. He left no issue, nor did his brother Roger, nor his sister Eleanor; but his sister Ann, married to the earl of Cambridge, had a son named Richard, who consequently became his uncle's representative, and (at least after the death of his mother) the individual on whom had devolved the claim by lineal descent to the crown. This Richard was also the representative of Edward III.'s fifth son, Edmund duke of York, his father the earl of Cambridge having been the second son of that prince, whose eldest son and heir, Edward duke of York, had fallen at the battle of Agincourt, leaving no issue, only a few months after his brother had been executed for the conspiracy mentioned above. At the time of his uncle's death, Richard, in consequence of his father's forfeiture, had no title; but he seems to have immediately assumed that of Earl of March; at least he is so called by some of the chroniclers, and the same title was also afterwards borne by his son, although the right of either to it may be questioned, inasmuch as it appears to have been only descendible to heirs male. Richard however is best known by his title of duke of York, which he took in 1425, on being restored in blood and allowed to inherit the honours both of his father and uncle. But it is important to recollect that the claim of the house of York to the crown in opposition to the house of Lancaster was not derived from Edward III.'s fifth son Edmund duke of York, who was younger than John of Gaunt, the founder of the house of Lancaster, but from Lionel duke of Clarence, who was that king's third son, John of Gaunt being his fourth.

As a clear notion of the above genealogical statement is important to the understanding of a considerable portion of English history, it may be proper once for all to exhibit it in the form most convenient for its ready apprehension, and for future reference to it. The line of the eldest son of Edward III. having failed in Richard II., and his second son having died without issue, the contest for the crown in the fifteenth century lay among the descendants of his third, fourth, and fifth sons, whose connexion with him and among themselves stood thus:—


Edward III.
Lionel, Duke of Clarence.
4. John, Duke of Lancaster.
5. Edmund, Duke of York.
Philippa = Edmund Mortimer, Earl of March.
Henry IV., d. 1413.
Edward, Duke of York, killed 1415.
Richard, Earl of Cambridge, executed 1415.
= Ann Mortimer, of Roger M
Earl of M
Roger Mortimer, Earl of March, d. 1398.
Henry V., d. 1422.
Richard, Duke of York, d. 1460.
Edmund Mortimer, Earl of March, d. 1424.
Ann Mortimer.
Henry VI
Edward, Earl of March (afterwards Edward VI.)

The persons whose names are printed in Italics are those in whom successively the hereditary right vested. We cannot discover however how Ann Mortimer survived her brother, or even that she survived him at all, although it seems to be usually assumed that she did.

Richard, duke of York, first makes his appearance in public affairs in the end of the year 1435, when he was appointed by Henry VI. to the regency of France on the death of the duke of Bedford. By the time he entered upon his office, however, Paris had been evacuated, and their French dominion was fast passing out of the hands of the English. He was recalled in 1437, but was reappointed on the death of his successor, the earl of Warwick, in July, 1440. On the 29th of April, 1441 (or, according to another account, in September, 1442), his son Edward, earl of March, afterwards Edward IV., was born at Rouen. The duke of York remained in France till after the conclusion of the king's marriage with Margaret of Anjou, in 1446; and his government was then prolonged for another term e years; but in 1447 he was recalled, through the ce of the queen and the favourite, the marquess of Suffolk, and Edmund Beaufort, earl (afterwards duke of) Somerset, the chief of the younger branch of the Lancaster family, appointed his successor. It is understood that before this the unpopular government of the queen and her favourite had turned men's minds to the claims of the house of York; and it is said that he himself, though he acted warily in the matter, was not idle by his emissaries in encouraging the disposition that began to grow up in his favour. The progress of events in course of time enabled him to take a bolder part in the promotion of the design he had already in all probability formed, of securing the crown for himself and his family. In 1449 he gained additional popularity by the able and conciliatory manner in which he suppressed an insurrection in Ireland. In the rising of the people of Kent the next year, their leader, Jack Cade, assumed the name of Mortimer as a sort of title. When he r in triumph through the streets of the metropolis, he called out, as he struck London Stone with his sword, 'Now is Mortimer lord of the city!' When the duke returned from Ireland, in August, 1451, some steps seem to have been taken by the court to oppose his landing; but he made his way to London, and immediately entered there into consultations with his friends. It was determined to demand the dismissal and punishment of the duke of Somerset, now the king's chief minister; but although this attempt was supported by an armed demonstration, it ended after a few months in the duke of York dismissing his followers, returning to his allegiance, and agreeing to retire to his estate. The king had now been married for several years without having any children, and it appears to have been generally expected that the duke, by merely waiting for his death, would obtain the crown without any risk or trouble. On the birth of the prince of Wales, however, in October, 1453, it became necessary to adopt another course. The spirit that showed itself in the parliament the following year forced the court to admit the duke of York and his chief friends and confederates, the two Nevilles (father and son), earls of Salisbury and Warwick, into the council, where their first act was to arrest the duke of Somerset and send him to the Tower. A few weeks after this (on the 3rd April, 1454), the duke of York was appointed by the parliament protector and defender of the kingdom during the illness of the king, who had fallen into a state of mental as well as bodily imbecility. In the following spring however Henry partially recovered, and resuming the management of affairs, released Somerset. This brought matters to a crisis. The duke of York now withdrew from court, and both parties collected their forces to decide their quarrel by the sword. The two armies met at St. Alban's on the 23rd of May, 1455, when the king was defeated, he himself being wounded and taken prisoner, and the duke of Somerset and others of the royal leaders slain. Henry, detained in the hands of the victor, was obliged to call a parliament, which met at Westminster on the 9th of July; and here the helpless king declared the duke and his friends to be innocent of the slaughter at St. Alban's, and greeted them as his 'free and faithful liegemen.' The parliament met again, after prorogation, on the 12th November, when the duke was a second time appointed protector. He was removed however by the king on the 23rd February, 1456; on which he again retired from court with his friends. The next two years passed without any further encounter, each party hesitating to attack the other. At last, in the spring of 1458, York and his friends were invited by the queen to London, to be reconciled to the Lancastrian party; an agreement to live for the future in peace was made with much solemnity; and the duke of York and the earls of Salisbury and Warwick were again admitted into the council. All this however seems to have been merely a stratagem of the queen's to get them into her power: their danger soon became apparent; and before the end of the year they all again withdrew from court. The resort to the final arbitrament could not now be much longer deferred. Both parties again collected their armed strength. Their first meeting took place at Blore-heath, near Drayton, in Shropshire, on the 23rd September, 1459, when the royal forces under Lord Audley were defeated by the earl of Salisbury, Audley himself being slain. On the 12th of October however the king's army met that of York and Warwick near Ludlow: ample offers of pardon were made to all who would come over to the royal side; and the consequence was, that so many of the insurgents deserted, that, almost without striking a blow, the rest threw down their arms, and their leaders were obliged to save themselves by flight. The duke of York and his adherents were attainted and their estates confiscated, at a parliament which met at Coventry a few weeks after. By June, 1460, however, the dispersed insurgents were again in arms. York landed from Ireland and Warwick from France nearly at the same time; the latter, whose numbers had now increased to 40,000 men, entered London on the 2nd of July; and on the 9th the royal forces, advancing from Coventry, were met near Northampton, by York's son Edward, the young earl of March, and signally defeated, the king being taken prisoner, and the queen and her son obliged to fly for their lives. This is the first appearance of Edward on the scene. Up to this time also the duke of York had never disputed Henry's title to the crown; he professed to have taken arms only to compel the king to dismiss his evil counsellors and to govern according to the laws. Even now Henry's name was still made use of by the victorious party. He was made to call a parliament, which met at Westminster on the 2nd October, and immediately annulled every thing that had been done by the late parliament of Coventry. But at this point the duke at last threw off all disguise. On the 16th he delivered to the parliament by his counsel a written claim to the crown. The question was formally discussed, and it was at length determined that Henry should be allowed to remain king during his life, but that the duke of York should be immediately declared his successor. Richard was accordingly, on the 1st of November, solemnly proclaimed heir apparent and protector of the realm; being in the latter capacity invested with rights and powers which already threw into his hands all of royalty except the name. But his dignity and authority were soon brought to an end. The queen found means to assemble an army in the north; on hearing which news the duke, on the 2nd of December, marched from London to give her battle. They met on Wakefield Green on the 31st, and the issue of their encounter was the complete defeat of York. He himself and one of his younger sons were slain, and the earl of Salisbury was taken prisoner, and executed the next day at Pomfret, with twelve of his associates. Edward, now duke of York, was at Gloucester when he heard of this disaster. A formidable royal force, commanded by the earls of Pembroke and Ormond, hung on his rear; this he attacked on the 2nd February, 1461, at Mortimer's Cross, near Hereford, and completely routed. He then set out for London, upon which the queen also was now directing her march. The next engagement that took place was at Bernard's Heath, near St. Alban's, where the queen was met on the 17th by the earl of Warwick: the earl, who had the king with him in the field, was defeated, and his majesty regained his liberty. The approach of the duke of York however deterred Margaret from continuing her advances upon the capital; she retired to the north, while he entered London on the 28th, amid the congratulations of the citizens. On the 2nd of March he laid his claim to the crown, founded on King Henry's alleged breach of the late agreement, before an assembly of lay and clerical lords; on the same afternoon an assembly of the people was held in St. John's Fields, at which his nomination as king was received with unanimous acclamations of assent; and two days after he was solemnly proclaimed by the name of Edward the Fourth. The 4th of March was considered as the day of his accession.

The first three years of the reign of Edward IV. were occupied by a prolongation of the contest that raged when he mounted the throne. The Lancastrians sustained a severe defeat from the king in person at Towton in Yorkshire, on the 29th of March, 1461; but Queen Margaret was unwearied in her applications for assistance to France and Scotland, and she was at last enabled to take the field with a new army. That too however was routed and dispersed at Hexham by the forces of Edward under the command of Lord Montagu, on the 17th of May, 1464. This victory, and the capture of Henry, which took place a few days after, put an end to the war. An event however occurred about the same time out of which new troubles soon arose. This was the marriage of the king with Elizabeth Woodville, the young and beautiful widow of Sir Thomas Gray, and the daughter of Sir Richard Woodville (afterwards created Earl Rivers) by Jacquetta of Luxemburg, whose first husband had been the late duke of Bedford. The connexions of the lady, both by her birth and by her first marriage, were all of the Lancastrian party; but Edward's passion was too violent to allow him to be stopped by this consideration; he was privately married to her at Grafton, near Stoney Stratford, on 1st May, 1464: she was publicly acknowledged as his wife in September; and she was crowned at Westminster on Ascension Day in the following year. The first effect of this marriage was to put an end to a negotiation, in which some progress had been made, with the French King Louis XI. for Edward's marriage with his sister-in-law the Princess Bonne of Savoy, an alliance which it was hoped might have proved a bond of amity betwixt the two kingdoms. It at the same time alienated from the king the most powerful of his supporters, the earl of Warwick, by whom the French negotiation had been conducted, and whose disapprobation of the king's conduct in a political point of view was consequently sharpened by the sense of personal ill usage. Above all, the honours and bounties lavished by Edward upon the obscure family of his queen disgusted the old nobility, and raised even a national feeling against him. It was some time before matters came to extremities; but at last, Warwick and Queen Margaret having entered into close alliance, England was once more, in 1469, deluged with the blood of a civil war. Nearly the whole of that and the following year was a season of confusion, of which it is scarcely possible to derive any consistent or intelligible account from the imperfect documents of the time that remain, and the ill-informed chroniclers who have attempted to describe the course of occurrences. At last, in the beginning of October, 1470, Edward found himself obliged to embark and fly to Holland. King Henry was now released from the Tower, in which he had been confined for the preceding six years, and the royal authority was again exercised in his name. This revolution earned for Warwick his well-known title of the King-maker. Henry's restoration however was a very short one. On the 14th March, 1471, Edward landed, with a force which he had raised in the Low Countries, at the mouth of the Humber, made his way to London, was received with acclamations by the citizens, again obtained possession of the imbecile Henry, and shut him up in his old prison. He then, on the 14th April, went out to meet Warwick, who was advancing from St. Alban's: the two armies encountered at Barnet; and the result was that the forces of the earl were completely defeated, and both he and his brother Lord Montagu were left dead on the field. The war was finished by the second defeat of the Lancastrians on the 14th May, at the great battle of Tewkesbury, where both Queen Margaret and her son Prince Edward fell into the hands of their enemies. Margaret was sent to the Tower, and was detained there till she was set at liberty in conformity with one of the articles of the treaty of Pecquigny, concluded with France in 1475, the French king paying for her a ransom of 50,000 crowns. Her unfortunate son was brought before Edward on the day after the battle, and brutally put to death in his presence by the hands of the dukes of Clarence and Gloucester (the king's brothers), assisted by two other noblemen. King Henry terminated his days in the Tower about three weeks after; and it has generally been believed that he was also violently taken off, and that his murderer was the duke of Gloucester. Many executions of the members of the Lancastrian party followed, and confiscations of their property in all parts of the kingdom.

The remainder of the reign of Edward IV. was marked by few memorable events. One that may deserve to be noticed is the fate of the king's next brother, George duke of Clarence, who was attainted of treason by a parliament which met in January, 1478, and immediately after privately put to death, being drowned, it was generally believed, in a butt of malmsey. He had at one time taken part with Warwick against his brother, and had sealed his alliance with the earl by marrying his daughter; nor, although he afterwards saw it prudent to break this connexion, had he and Edward ever probably been cordially reconciled. It seems to have been chiefly his nearness to the throne that at last fixed his brother in the determination of getting rid of him. Edward was at war both with Scotland and with France during the greater part of his reign; but the military operations that took place were unimportant, and are not worth relating: they were never carried on with any vigour, and were frequently suspended by long truces, which however, in their turn, were generally broken by the one nation or the other before the proper term. In June, 1475, Edward having previously sent a herald to King Louis to summon him to surrender the whole kingdom of France, embarked with a large force, and landed at Calais; but the expedition ended within three months in the treaty of Pecquigny, or Amiens, already mentioned. By one of the articles it was agreed that the dauphin, Charles, should marry Elizabeth, the king of England's eldest daughter; and Louis also engaged to pay Edward an annuity of 50,000 crowns a year as long as they both lived. It appears that Edward's ministers as well as their royal master consented to receive pensions from the French king: large amounts of money were distributed among them from time to time; and in their case at least this foreign pay was a mere bribe to engage them in the interests of the power from which they received it. Edward however is asserted to have himself shared in their gains; indeed his own acknowledged annuity, though it might bear the appearance of a compensation for advantages which he had given up, was itself in reality nothing else than a bribe; it was a supply obtained independently of parliament and the country. He was driven indeed to many other shifts and illegal methods, as well as this, to raise money for his wasteful debaucheries and extravagant expenditure on the mistresses, favourites, and others that ministered to his personal pleasures. Louis however appears never to have had any intention of fulfilling his engagement as to the marriage; for some years he evaded Edward's importunities as well as he could; till at length, in 1482, he contracted the dauphin in another quarter. Edward, incensed in the highest degree, was preparing to avenge this affront by a new descent upon France, in which the parliament had eagerly promised to assist him with their lives and fortunes, when he was suddenly cut off by a fever, on the 9th of April, 1483, after a reign of twenty-two years.

Edward IV. had by his wife Elizabeth three sons; Edward, who succeeded him; Richard, duke of York, born in 1474; and George, duke of Bedford, who died in infancy; and seven daughters; Elizabeth, born 11th of February 1466, contracted to the dauphin, and afterwards married to Henry VII.; Cecilia, contracted to Prince James (afterwards James IV.) of Scotland, and afterwards married first to John Viscount Wells, secondly to Mr. Kyme, of Lincolnshire; Anne, contracted to Philip, son of the archduke Maximilian of Austria and his wife the duchess of Burgundy, and afterwards married to Thomas Howard duke of Norfolk; Bridget, born at Eltham, 10th November, 1480, who became a nun at Dartford; Mary, contracted to John I., king of Denmark, Norway, and Sweden, but who died at Greenwich, in 1482, before the marriage was solemnized; Margaret, born 19th April, 1472, who died 11th December following; and Catherine, contracted to John, elder son of Ferdinand and Isabella of Spain, and afterwards married to William Courtenay, earl of Devonshire. By one of his many mistresses, Elizabeth Lucy, he had two natural children; Arthur, surnamed Plantagenet, created Viscount Lisle by Henry VIII.; and Elizabeth, who became the wife of Thomas lord Lumley.

Edward IV. has the reputation of having been zealous and impartial in the administration of justice; but with the exception of some statutes abridging the antient jurisdiction of sheriffs, and transferring part of the powers of those officers to the quarter-sessions, no important innovations were made in the law during this reign. It is from this period however that the rise of what is called [illegible] pleading is dated. In this reign also the practice of suffering common recoveries by a tenant in tail, as a means of barring his estate tail, and also all the estates in remainder and reversion, was fully established by judicial decision (in the 12th year of this king) after it had been interrupted for some time by the statute of Westminster 2, 13 Ed. I., c. [illegible] The reduction of the law and its practice to a scientific form is considered to have made great progress in the latter part of the reign of Henry VI., and in that of Edward IV. To the latter belong the treatise 'De Laudibus Legum Angliæ' of Sir John Fortescue, the celebrated treatise on Tenures of Sir Thomas Littleton, and the [illegible] called Statham's Abridgment of the Law. The Year Books also began now to be much more copious than in former reigns.

Many laws relating to trade and commerce passed in the reign of Edward IV. attest the growing consequence of those interests, but are not in other respects important, and do not show that more enlightened views began to be entertained than had heretofore prevailed. The manufacture of articles of silk, though only by the hand, was first introduced into this country; and we find the parliament endeavouring to protect it by the usual method of prohibiting the importation of similar articles made abroad. This reign is illustrious as being that in which the art of printing was introduced into England. [CAXTON.]

The testimony of historians concurs with the probability of the case in assuring us that the country must have been subjected to much devastation and many miseries during the bloody and destructive wars of York and Lancaster; but this contest was undoubtedly useful in shaking the iron-bound system of feudalism, and clearing away much that obstructed the establishment of a better order of things. The country seems to have very soon recovered from the immediate destruction of capital and property occasioned by these wars.

EDWARD V., the eldest son of Edward IV., was born 4th of November, 1470, in the Sanctuary at Westminster Abbey, where his mother had taken shelter when her husband was obliged to fly to the Continent on the return of Queen Margaret and the earl of Warwick. He was consequently only in his thirteenth year when his father died. His reign is reckoned from the 9th of April, 1483, the day of his father's decease; but during the few weeks it lasted he never was a king in more than name. The public transactions of his reign all belong properly to the history of his uncle, Richard III. Edward was at Ludlow in Shropshire at the time of his father's death, and possession of his person was obtained at Northampton by Richard (then duke of Gloucester) as he was on his way to London in charge of his maternal uncle Anthony earl Rivers. He appears not to have been brought to London till the beginning of May. In the course of that month, and probably between the 24th and 27th, Richard was declared at a great council protector of the king and the kingdom. On the 16th of June he contrived to obtain Edward's younger brother, the duke of York, out of the hands of the queen his mother, who had taken refuge in Westminster Abbey with him and his sister. The two boys were forthwith removed to the Tower, then considered one of the royal palaces, there to remain, as was pretended, till the coronation of the young king, which was appointed to take place on the 22nd. Before that day arrived however Richard had completed his measures for placing the crown on his own head. The 26th of June is reckoned the commencement of his reign, and the close of that of his nephew. After this Edward and his brother were seen no more. They were however universally believed to have been made away with by Richard. The account which has been generally received is that given by Sir Thomas More, whose testimony may be regarded as that of a contemporary, for he was born some years before the death of Edward IV. His statement is in substance that Richard, while on his way to pay a visit to the town of Gloucester after his coronation, sent one John Green, 'whom he specially trusted,' to Sir Robert Brackenbury, the constable of the Tower, with a letter *desiring Sir Robert* to put the children to death; that Brackenbury declared he would not commit so dangerous a deed; that Sir James Tyrrel was then despatched with a commission to receive the keys of the Tower for one night; and that under his directions the children were about midnight stifled in bed with their feather-beds and pillows, by Miles Forest, 'one of the four that kept them, a fellow fleshed in murder beforetime,' and John Dighton, Tyrrel's own horse-keeper, 'a big, broad, square, and strong knave.' The relation is given in the fullest and most particular form, not in the Latin translation of More's History, or in the re-translation of that into English, published (with a strange ignorance that the work already existed in English) in Bishop Kennet's Collection of Histories (3 vols. folio, 1706); but in the English work, which we believe is the original. It is printed in full from More's works in Holinshed, who describes it as written about the year 1513. More does not give the story as merely 'one of the various tales he had heard concerning the death of the two princes' (Henry's *Hist. of Great Britain*; and Walpole's *Historic Doubts on the Life and Reign of Richard III.*); he introduces it by saying, 'I shall rehearse you the dolorous end of those babes, not after every way that I have heard, but after that way that I have so heard by such men and by such means, as methinketh it were hard but it should be true;' and he closes the narrative by repeating that it is what he had 'learned of them that much knew, and little cause had to lie.' It is perfectly evident that he had not himself a doubt of its truth. 'Very truth is it,' he says moreover, 'and well known, that at such time as Sir James Tyrrel was in the Tower, for treason committed against the most famous prince, king Henry VII., both Dighton and he were examined, and confessed the murder in manner above written.' The common story seems to be supported by the honours and rewards which were immediately bestowed by Richard upon Tyrrel, Brackenbury, Green, and Dighton. (See these stated in Strype's *Notes on Sir George Buck's Life and Reign of Richard III.*, book 3rd.) Symnell or Simnel, who in the reign of Henry VII. assumed the character of Edward Plantagenet, son of George duke of Clarence, seems to have originally intended to pass himself as Edward V. Perkin Warbeck, who appeared some years after, called himself Edward's brother, Richard duke of York.

Buck and others who have endeavoured to disprove King Richard's guilt, have rested much of their argument on the fact that the remains of Edward and his brother never could be found in the Tower, although much search had been made for them; but on the 17th of July, 1674, in making some alterations, the labourers found, covered with a heap of stones at the foot of an old pair of stairs, a quantity of partially consumed bones, which, on examination appeared to be those of two boys of the ages of the two princes. They were removed by order of Charles II. to Henry VII.'s chapel in Westminster Abbey, where the inscription placed over them recites that they appeared by undoubted indications to be those of Edward V. and his brother. [Ossa desideratorum diu et multum quæsita, &c., scalarum in ruderibus (scalæ istæ ad sacellum Turris Albæ nuper ducebant) alte defossa, indiciis certissimis sunt reperta, &c.] This discovery is sufficiently in conformity with More's account, who tells us that Tyrrel caused the murderers to bury the bodies 'at the stair foot, meetly deep in the ground under a great heap of stones.' It is true he mentions a report that Richard 'allowed not the burying in so vile a corner, saying that he would have them buried in a better place, because they were a king's sons; whereupon they say that a priest of Sir Robert Brackenbury's took up the bodies again, and secretly interred them in such place as, by the occasion of his death which only knew it, could never since come to light.' This however is evidently a story both improbable in itself, and one which, although it might naturally enough arise and get into circulation, could never have rested on any trustworthy authority. More gives it as a mere rumour, and we may fairly infer, from the words ('as I have heard') with which it is introduced, that he did not himself believe it. He carefully adds, in his notice of the examination of Tyrrel and Dighton, 'but whither the bodies were removed they could nothing tell.' Tyrrel was executed for his treason; but Dighton still lived when More wrote. He says of him, 'Dighton indeed yet walketh on alive, in good possibility to be hanged ere he die.' According to Grafton, 'Dighton lived at Calais long after, no less disdained and hated than pointed at.' The reader may also compare upon this subject the account of the examinations of Tyrrel and Dighton given by Bacon in his History of King Henry VII. (Montagu's edition of Bacon's Works, iii., 287, 288.) It agrees very closely with the story told by More. Bacon says that Dighton, who was set at liberty after the examinations, 'was the principal means of divulging this tradition;' and from the use of that expression it has been inferred that Bacon regarded the whole as an idle tale. But he has in several places in this work distinctly expressed his belief of the guilt both of Richard and Tyrrel; especially in his notice (p. 385) of the execution of Tyrrel, 'against whom,' he says, 'the blood of the innocent princes, Edward V. and his brother, did still cry from under the altar.' Tyrrel's examination, we may observe, appears to have taken place in 1493; but he was not executed till 1503. He was committed to the Tower in the first of these years on the appearance of Perkin Warbeck, expressly that he might be examined touching the murder; and it was on quite another charge that he was executed ten years after. More's account therefore of the circumstances of his confession is slightly inaccurate. He does not however expressly say, as Sir James Mackintosh makes him do (*Hist. Eng.*, ii., 39), that Tyrrel 'confessed his guilt *when he was executed twenty years after for* concealing the murder of the earl of Suffolk.' Bacon himself, who relates, in their proper places, both his first imprisonment and his execution, says inaccurately that he was beheaded 'soon after' the examinations. [RICHARD III.]

EDWARD VI., the only son of Henry VIII. who survived him, was born at Hampton Court 12th October, 1537. His mother, Queen Jane Seymour, died on the twelfth day after giving him birth. The child had three stepmothers in succession after this; but he was probably not much an object of attention with any of them. Sir John Hayward, who has written the history of his life and reign with great fulness, says that he 'was brought up among nurses until he arrived to the age of six years.' He was then committed to the care of Dr. (afterwards Sir Anthony) Cooke, and Mr. (afterwards Sir John) Cheke, the former of whom appears to have undertaken his instruction in philosophy and divinity, the latter in Greek and Latin. The prince made great proficiency under these able masters. Henry VIII. died at his palace at Westminster early in the morning of Friday the 28th of January, 1547; but it is remarkable that no announcement of his decease appears to have been made till Monday the 31st, although the parliament met and transacted business on the intervening Saturday. Edward, who was at Hatfield when the event happened, was brought thence in the first instance to the residence of his sister Elizabeth at Enfield, and from that place, on the 31st, to the Tower at London, where he was proclaimed the same day. The council now opened the will of the late king (executed on the 30th of December preceding), by which it was found that he had (according to the powers granted him by the acts 28 Hen. VIII. ch. 7, and 35 Hen. VIII. ch. 1) appointed sixteen persons under the name of executors, to exercise the powers of the government during the minority of his son. One of these, the king's maternal uncle, Edward Seymour, earl of Hertford, was immediately elected by the rest their president, and either received from them in this character, or assumed of his own authority, the titles of governor of his majesty, lord protector of all his realms, and lieutenant-general of all his armies. He was also created duke of Somerset, and soon after took to himself the office of lord high treasurer, and was further honoured by being made earl marshal for life. About the same time his brother, Sir Thomas Seymour, was created Baron Seymour of Sudley, and appointed lord high admiral. The elevation of Somerset had been opposed by the lord chancellor Wriothsley (now earl of Southampton); but the protector in a few weeks got rid of his further interference by taking advantage of an informality into which the earl had fallen in the execution of his office of chancellor, and frightening him into a resignation both of the seals and of his seat in the executive council.

The period of the administration of the protector Somerset forms the first of the two parts into which the reign of Edward VI. divides itself. The character of the protector has been the subject of much controversy; but opinions have differed rather as to the general estimate that is to be formed of him, or the balance of his merits and defects, than as to the particular qualities, good and bad, by which he was distinguished. It may be said to be admitted on all hands that he was a brave and able soldier, but certainly with no pretensions in that capacity to a humanity beyond his age; that as a statesman he was averse to measures of severity, and fond of popular applause, but unstable, easily influenced by appeals either to his vanity or his fears, and without any fertility of resources, or political genius of a high order. It must be admitted also that he was both ambitious and rapacious in no ordinary degree. Add to all this, that with one of the two great parties that divided the country he had the merit, with the other the demerit, of being a patron of the new opinions in religion—and it becomes easy to understand the opposite feelings with which he was regarded in his own time, and the contradictory representations that have been given of him by party writers since.

One of the first acts of his administration was an expedition into Scotland, undertaken with the object of compelling the government of that country to fulfil the treaty entered into with Henry VIII. in 1543 for the marriage of the young Queen Mary to Edward. The Scottish forces were signally defeated by the English protector at the battle of Pinkey, fought 10th September, 1547; but the state of politics, as bearing upon his personal interests in England, compelled Somerset to hasten back to the south without securing any of the advantages of his victory. He returned to Scotland in the summer of the following year; but he wholly failed in attaining any of the objects of the war. The young queen was conveyed to France; and the ascendency of the French or Catholic party in the Scottish government was confirmed, and continued unbroken during all the rest of the reign of Edward.

Meanwhile great changes were effected in the domestic state of England. The renunciation of the supremacy of the pope, the dissolution of the religious houses, and the qualified allowance of the reading of the Scriptures in English, were the principal alterations in religion that had been made up to the death of the late king. Only a few months before the close of the reign of Henry, Protestants as well as Catholics had been burned in Smithfield. Under Somerset and the new king measures were immediately taken to establish Protestantism as the religion of the state. Even before the meeting of parliament, the practice of reading the service in English was adopted in the royal chapel, and a visitation, appointed by the council, removed the images from the churches throughout the kingdom. Bishops Gardiner of Winchester and Bonner of London, who resisted these measures, were committed to the Fleet. The parliament met in November, when bills were passed allowing the cup to the laity, giving the nomination of bishops to the king, and enacting that all processes in the ecclesiastical courts should run in the king's name. The statute of the Six Articles, commonly called the Bloody Statute, passed in 1539, was repealed, along with various other acts of the preceding reign for the regulation of religion. By the parliament of 1548 the use of the Book of Common Prayer was established, and all laws prohibiting spiritual persons to marry were declared void. At the same time an act was passed (2 and 3 Ed. VI. c. 19) abolishing the old laws against eating flesh on certain days, but still enforcing the observance of the former practice by new penalties, 'the king's majesty,' says the preamble, 'considering that due and godly abstinence is a mean to virtue, and to subdue men's bodies to their soul and spirit, and considering also specially that fishers, and men using the trade of living by fishing in the sea, may thereby the rather be set on work, and that by eating of fish much flesh shall be saved and increased.'

But Somerset's path was now crossed by a new opponent in the person of his own brother, Lord Seymour. This nobleman, equally ambitious with the protector, but of a much more violent and unscrupulous temper, is supposed to have, very soon after the king's accession, formed the design of disputing the supreme power with his brother. It is said to have been a notice of his intrigues that suddenly recalled Somerset from Scotland after the battle of Pinkey. The crime of Seymour does not appear to have gone farther than caballing against his brother; but Somerset contrived to represent it as amounting to high treason. On this charge he was consigned to the Tower; a bill attainting him was brought into the House of Lords, and read a first time on the 25th of February, 1549; it was passed unanimously on the 27th. The accused was not heard in his own defence, nor were any witnesses examined against him; the House proceeded simply on the assurance of his brother, and of other members of the council, that he was guilty. The bill was afterwards passed, with little hesitation, by the House of Commons; it received the royal assent on the 14th of March; and on the 20th Lord Seymour was beheaded on Tower-hill, with his last breath solemnly protesting his innocence.

During the summer of this year the kingdom was disturbed by formidable insurrections of the populace in Somerset, Lincoln, Kent, Essex, Suffolk, Devon, Cornwall, and especially in Norfolk, where a tanner of the name of Kett opposed the government at the head of a body of 20,000 followers. The dearness of provisions, the lowness of wages, the enclosure of common fields, and in some places the abolition of the old religion, with its monasteries where the poor used to be fed, and its numerous ceremonies and holidays that used to gladden labour with so much relaxation and amusement, were the principal topics of the popular clamour. It is worth noticing that the agency of the press was on this occasion employed, probably for the first time, as an instrument of government. Holinshed records that 'while these wicked commotions and tumults, through the rage of the undiscreet commons, were thus raised in sundry parts of the realm, sundry wholesome and godly exhortations were published, to advertise them of their duty and to lay before them their heinous offences.' Among them was a tract by Sir John Cheke, entitled 'The Hurt of Sedition, how grievous it is to a Commonwealth,' which is a very able and vigorous piece of writing. It was found necessary however to call another force into operation: the insurgents were not put down without much fighting and bloodshed; and many of the rebels were executed after the suppression of the commotions. The institution of lords lieutenants of counties arose out of these disturbances.

A few months after these events brought Somerset's domination to a close. His new enemy, John Dudley, formerly Viscount Lisle, and now Earl of Warwick, the son of that Dudley whose name is infamous in history for his oppressions in the reign of the seventh Henry, had probably been watching his opportunity, and carefully maturing designs against the protector, for a long time. It is supposed to have been through his dark and interested counsel that Somerset was chiefly impelled to take the course which he did against his brother; Warwick's object was to destroy both, and he probably counted that by the admiral's death, and the part which the protector was made to take in it, he both removed one formidable rival, and struck a fatal blow at the character and reputation of another. He himself meanwhile had been industriously accumulating popularity and power. He had greatly distinguished himself at the battle of Pinkey, and in other passages of the Scotch war; and it had been chiefly by him that the late insurrection in Norfolk had been so effectually quelled. The energy which he showed on this occasion was contrasted by the enemies of the protector with what they represented as the feebleness of the latter, who had, they contended, encouraged the insurrection by the hesitation and reluctance which he manifested, on the first threatenings of it, to take the necessary measures for putting it down. The protector had at this time incurred considerable odium by his lavish expenditure (out of the spoils, as as it was said, of the church) on his new palace of Somerset House, and certain violations both of public and of private rights of which he was accused of having been guilty in procuring the space and the materials for that magnificent structure. A cry was also raised against him on account of a proposition he had made in the council for a peace with France on the condition of resigning Boulogne for a sum of money. In the beginning of October he learned that measures were about to be immediately taken against him. In fact Warwick and his associates in the council had collected their armed retainers, and were now ready to employ force if other means should fail. They had retired from Hampton Court, where the king resided, and fixed themselves in London, where they had contrived to obtain possession of the Tower. Somerset, on the first notice of their proceedings, carried off the king to Windsor Castle, and shut himself up there as if with the intention of holding out; but he soon found himself nearly deserted by all; and after a few days the king himself was obliged to sanction the vote for his deposition passed by the majority of the council. On the 14th he was brought to London in custody, and sent to the Tower. From this moment Warwick, though without his title of protector, enjoyed his power. Somerset, reduced to insignificance by this usage, but especially by an abject submission which he made in the first moments of danger, was some time after this released from confinement, and was even allowed again to take his seat at the council-table; but he either engaged in designs to regain his lost place, or Warwick, now duke of Northumberland, and possessed almost of undivided power in the state, felt that he should not be quite secure so long as his old rival lived. An apparent reconciliation had been effected between the two, and ratified by the marriage of Warwick's eldest son to Somerset's daughter; but this connexion was no shelter to the overthrown protector: on the 1st of December, 1551, he was brought to trial before the high steward and a committee of the House of Lords, on charges both of high treason and of felony; he was convicted of the latter crime; and was executed on Tower Hill, the 22nd January, 1552. He met his death with great manliness, and the popular sympathy was deeply excited in his favour, both by the feeling that, with some faults, he had fallen the victim of a much worse man than himself, and by the apprehension that in his destruction the great stay which had hitherto supported the Reformation in England was thrown down.

Warwick however (although at his death, a few years after this, he declared that he had always been a Catholic) did not feel himself strong enough to take any measures openly in favour of the antient faith, opposed as he knew he would be in that course by the great mass of the nation. It is probable that he cared little which religion prevailed so that he remained at the head of affairs. The government accordingly continued to be conducted in all respects nearly as it had heretofore been. In March, 1550, a peace had been concluded with France, one of the articles stipulating for the surrender of Boulogne, the support of which very proposition had been made the principal charge against Somerset a few months before. In the following July another treaty between the two countries was signed at Angers, by which it was agreed that the king of England should receive in marriage Elizabeth, the daughter of the king of France. Meanwhile at home the matter of religion continued to be treated by the new government much as it had been by the old. No Roman Catholics were put to death during this reign, though many were fined, imprisoned, and otherwise not capitally punished; but on the 2nd of May, 1550, an unfortunate fanatic, Joan Becher, commonly called Joan of Kent, was burnt for certain opinions considered to be neither Catholic nor Protestant, in conformity with a warrant extorted by Cranmer from the king about a year before; and on the 2nd of May, 1551, an eminent surgeon, named Von Panis, of Dutch extraction, but resident in London, paid the same penalty for his adherence to a similar heresy. Bishop Bonner was deprived of his see in September, 1549; Gardiner, in January, 1551; and Day of Chichester, and Heath of Worcester, in October of the same year. The forty-two articles of belief, afterwards reduced to thirty-three, were promulgated in the early part of this year.

In April, 1552, Edward was attacked by small-pox; and, although he recovered from that disease, the debility in which it left him produced other complaints, which ere long began to assume an alarming appearance. By the beginning of the following year he was very ill. Northumberland now lost no time in arranging his plans for bringing the crown into his own family. In May his son Lord Guilford Dudley married the Lady Jane Grey, the eldest daughter of the duchess of Suffolk, who was herself the eldest daughter, by her second marriage with Charles Brandon, duke of Suffolk, of Mary Tudor, the ex-queen of France, and the daughter of Henry VII., upon whose descendants Henry VIII. had by his will settled the crown on failure of the lines of his son Edward and of his daughters Mary and Elizabeth. This settlement, it is to be remembered, had been made by Henry under the express authority of an act of parliament, which empowered him to dispose of the kingdom to whomsoever he chose, on failure of his three children. Northumberland now applied himself to induce Edward to make a new settlement excluding Mary and Elizabeth, who had both been declared illegitimate by parliament, and to nominate Lady Jane Grey (in whose favour her mother the duchess of Suffolk, still alive, agreed to renounce her claim) as his immediate successor. The interest of the Protestant religion, which it was argued would be more secure with a sovereign on the throne whose attachment to the principles of the Reformation was undoubted, and upon whose birth there was no stain, than if the succession were left to be disputed between the king's two sisters, one of whom was a bigoted Catholic, and the legitimacy of either of whom almost implied the illegitimacy of the other, is believed to have been the chief consideration that was urged upon the dying prince. Edward at all events was brought over to his minister's views. On the 11th of June, Montague, the chief justice of the Common Pleas, and two of his brethren, were sent for to Greenwich, and desired to draw up a settlement of the crown upon the Lady Jane. After some hesitation they agreed, on the 14th, to comply with the king's commands, on his assurance that a parliament should be immediately called to ratify what was done. When the settlement was drawn up, an engagement to maintain it was subscribed by fifteen lords of the council and nine of the judges. Edward sunk rapidly after this, and lived only till the evening of the 6th of July, when he expired at Greenwich. His death, however, was concealed for two days, and it was not till the 9th that Lady Jane Grey was proclaimed.

Edward VI. is stated by the famous Jerome Cardan, who was brought to see him in his last illness, to have spoken both French and Latin with perfect readiness and propriety, and to have been also master of Greek, Italian, and Spanish. In his conversation with Cardan, which the latter has preserved, he showed an intelligence and dexterity which appear to have rather puzzled the philosopher. Walpole has set him down among his royal authors on the strength of his 'Diary,' printed by Barnet in his History of the Reformation, and the original of which is still preserved among the Cottonian manuscripts; a lost comedy which is attributed to him, called 'The Whore of Babylon;' some Latin epistles and orations, of which specimens are given by Strype; a translation into French of several passages of scripture, preserved in the library of Trinity College, Cambridge; a tract in French against popery, entitled 'L'En contre des abus du monde;' and a few other productions of a similar kind which have not been printed.

The act of the 1st Edward VI. gave to the king all the colleges, free-chapels, chauntries, hospitals, &c., which were not in the possession of his father by the act passed in the 37th year of Henry's reign. This act was much abused; for though one professed object of it was the encouragement of learning, many places of learning were actually suppressed under it. The king, however, afterwards founded a considerable number of grammar-schools, which still exist and are popularly known as King Edward's Schools. [Birmingham, &c.] (Strype's *Ecclesiastical Memorials*, vols. ii. iii.; *Journal of Education*, No. 19.)

In 1556, in the reign of Queen Mary, a boy of the name of William Fetherstone, or Constable, a miller's son, was hanged at Tyburn for giving himself out to be Edward VI.

EDWARD THE BLACK PRINCE. [Edward III.]

EDWARDS, JONATHAN, was born at East Windsor, in the province of Connecticut, on the 5th of October, 1703. He was the only son, among eleven children, of Timothy Edwards, who was minister of East Windsor, or (as it was then) the eastern parish of Windsor, during a period of sixty-three years, and who, being a learned, exemplary, and devout man, was much beloved and respected by his flock. Until the age of thirteen, Jonathan was educated at home. He began to learn Latin when six years old, under the care of his father and elder sisters, all of whom the father had made proficients in that language. He seems to have begun writing letters and essays at a very early age; and such of his early compositions as are preserved show a remarkable inquisitiveness concerning both mental and natural phenomena, and a by no means contemptible skill in explaining them. President Dwight, his biographer, has given a fragment written by him in the bantering style, when he could not have been more than twelve years old, against some one who had contended for the materiality of the soul, which shows considerable wit, reach of thought, and power of expression. There is also preserved an entertaining and instructive account of the habits of spiders, as observed by himself, which was written before he was thirteen. He was also led very early to religious meditation, and imbued with a deep sense of religion. He says of himself, in an account of his religious progress, written later in life for the benefit of his children:—'I had a variety of concerns and exercises about my soul from my childhood; but had two more remarkable seasons of awakening before I met with that change by which I was brought to those new dispositions, and that new sense of things, that I have since had. The first time was when I was a boy, some years before I went to college, at a time of remarkable awakening in my father's congregation. I was then very much affected for many months, and concerned about the things of religion, and my soul's salvation; and was abundant in religious duties. I used to pray five times a-day in secret, and to spend much time in religious conversation with other boys. . . . . I, with some of my school-fellows, joined together, and built a booth in a swamp, in a very retired spot, for a place of prayer. And besides I had particular secret places of my own in the woods, where I used to retire by myself, and was from time to time much affected.'

He went to Yale College, in Newhaven, at the age of thirteen. In the second year of his residence at the college, when only fourteen, he read through Locke's 'Essay on the Human Understanding;' and President Dwight has published some of his notes on the topics treated of in the essay, which show that he could then understand and appreciate it. The same biographer has published notes on the natural sciences and on theology, which were collected by Edwards during his stay at college. It was in the fourth and last year of his collegiate life that his second 'awakening' took place, an awakening which was speedily followed by a second relapse. 'But in process of time,' he observes in continuation of what has been already quoted, 'my convictions and affections wore off; and I entirely lost all those affections and delights, and left off secret prayer, at least as to any constant performance of it; and returned like a dog to his vomit, and went on in the ways of sin. Indeed I was at times very uneasy, especially towards the latter part of my time at college; when it pleased God to seize me with a pleurisy, in which he brought me nigh to the grave, and shook me over the pit of hell. And yet it was not long after my recovery before I fell again into my old ways of sin.' His final and entire conversion took place shortly after his taking his B.A. degree, in September, 1720. The chief symptom of his 'conversion' is thus described by him:—'From my childhood up, my mind had been full of objections against the doctrine of God's sovereignty in choosing whom he would to eternal life, and rejecting whom he pleased: leaving them eternally to perish, and be everlastingly tormented in hell. It used to appear like a horrible doctrine to me; but I remember the time very well when I seemed to be convinced, and fully satisfied, as to this sovereignty of God, and his justice in thus eternally disposing of men according to his sovereign pleasure. . . . . . And there has been a wonderful alteration in my mind with respect to the doctrine of God's sovereignty, from that day to this; so that I scarce ever have found so much as the rising of an objection against it in the most absolute sense, in God showing mercy to whom he will show mercy, and hardening whom he will. God's absolute sovereignty and justice, with respect to salvation and damnation, is what my mind seems to rest assured of, as much as of anything that I see with my eyes; at least it is so at times.'

Edwards stayed at college two years after taking his B.A. degree, preparing for the ministry.. In August, 1722, he went to New York, having been invited by the English Presbyterians in that town to come among them as their minister. His diary records constant religious meditations during his eight months' stay at New York; and on the 12th of January, 1723, he relates that he solemnly dedicated himself to God. 'I made a solemn dedication of myself to God, and wrote it down, giving up myself, and all that I had, to God; to be for the future in no respect my own; to act as one that had no right to himself in any respect.' He left New York in April, 1723, and returned home. In September of the same year he took his M.A. degree, and shortly after he was chosen tutor of Yale College. Two years after he accepted an invitation from Northampton, in Massachusetts, to assist his maternal grandfather, the Rev. Solomon Stoddard, in the ministry; and, having resigned his tutorship, he was ordained colleague to his grandfather at Northampton in February, 1727, in the twenty-fourth year of his age. Shortly after, he married.

Between the time of his going to New York and his settlement at Northampton, Edwards wrote out seventy resolutions, which he kept before him as his guides through the remainder of his life. They are published in President Dwight's Life. They mostly refer to the governing of his morals and the performance of religious exercises.

He remained at Northampton, first as assistant to his grandfather, and, after his grandfather's death, as sole minister, for twenty-three years. He was, all this while, indefatigable in the discharge of his duties as minister, and diligent in self-improvement. He was an effective preacher, and acquired much fame on the occasion of a very general revival in the years 1740 and 1741: ministers and congregations from all parts of New England applied to Edwards for assistance, and solicited him to come among them and preach. It was at the time of this revival, and in order to moderate men's zeal, that he wrote his treatise on 'Religious Affections.' A revival had previously taken place in his own parish of Northampton, in 1734; an account of which was at the time published by himself under the title, 'A faithful narrative of the surprising work of God, in the conversion of many hundred souls in Northampton.'

On the 22nd of June, 1750, Edwards was dismissed ignominiously from his charge at Northampton. He had offended a large and influential part of his congregation, no less than six years previously, by taking some very active and, as they appeared, arbitrary measures in consequence of a reported circulation of obscene books among the younger members of his flock. He was openly resisted in his attempts to make a public example of the offenders; and from that time his influence over his flock was greatly weakened. But the cause of the final rupture between himself and his flock, and of his dismissal, was a different one. It was a refusal to admit 'unconverted' persons, or (in other words) persons who either could or would not say that they had really embraced Christianity, to a participation in the sacrament. The custom of admitting such persons had been introduced by his predecessor, and not without opposition; and now, after the custom had been established some time, a fiercer opposition was raised by an attempt to get rid of it. On Edwards's first announcement of his disapprobation of the custom, and of his determination to end it, his dismissal was immediately clamoured him. This was in the spring of 1744; and the six intervening years having been spent in continual disputes, and fruitless attempts to effect a reconciliation, he was dismissed in 1750. A council had been appointed, consisting of ten neighbouring ministers, to adjudicate between Edwards and his flock; and this council determined by a majority of one, 'that it is expedient that the pastoral relation between Mr. Edwards and his church be immediately dissolved, if the people still persist in desiring it.' On its being put to the people, more than two hundred voted for his dismissal, and only twenty against it.

In August, 1751, Edwards went as missionary to the Indians at Stockbridge, a town in the western part of Massachusetts Bay, having been applied to for the purpose by the Boston Commissioners for Indian Affairs, and having also received an invitation from the inhabitants of Stockbridge. Here he had much leisure; and it was during his stay at Stockbridge that he wrote his Inquiry into the Freedom of the Will, and his Treatise on Original Sin. The first of these works, and that on which his fame chiefly rests, was written in nine months, and was published in 1754. In 1757 he was chosen, without any solicitation on his part, and much to his surprise, president of Princeton College, New Jersey. Having after some deliberation accepted the appointment, he went to Princeton in January, 1758, and was installed president. He died of the small-pox on the 22nd of the following March.

It may be inferred, from the account which we have given of his life, that the character of Jonathan Edwards was eminently estimable. He was an industrious, meek, conscientious, kind, and just man. In religion he was a Calvinist; and his principal work, that on the Will, was written in defence of the Calvinistic views on that subject and against those entertained by Arminians.

Edwards's chief works are, 1. 'A Treatise concerning Religious Affections;' 2. 'An Inquiry into the modern prevailing notions respecting that Freedom of the Will which is supposed to be essential to Moral Agency, Virtue and Vice, Reward and Punishment, Praise and Blame;' 3. 'The Great Christian Doctrine of Original Sin defended; containing a Reply to the Objections of Dr. John Taylor;' 4. 'The History of Redemption;' 5. 'A Dissertation concerning the end for which God created the World;' and 6. 'A Dissertation concerning the true nature of Christian Virtue.' The three last works were published after his death.

The best and most complete edition of Edwards's works is that edited by President Dwight, in 10 volumes. There is also an edition in 8 volumes, published in London, 1817. The 'Inquiry into the Freedom of the Will' has lately been published separately, with an Introductory Essay by Mr. Taylor, the author of 'The Natural History of Enthusiasm.'

EDWARDS, BRYAN, the historian of the British West India colonies, was born at Westbury, in Wiltshire, May 21, 1743. Family distresses caused him, towards the end of 1759, to go to Jamaica, where he was most kindly received by his mother's brother, Zachary Bayly, a rich, generous, and enlightened planter, who, seeing the young man's fondness for books, and thinking well of his talents, procured a tutor to reside with him. His early instruction had been confined to reading, writing, and the French and English languages; and his studies in Jamaica, by his own account, were slight and desultory: still we may fairly ascribe to them no small share in preserving him from that intellectual listlessness into which Europeans sent out in early life to tropical climates are apt to fall. At this period the autobiography prefixed to the second and later editions of his 'History of the West Indies' ends; and the accounts given of his remaining life are extremely scanty. It appears, however, that in due time he succeeded to his uncle's fortune, became a wealthy merchant, and an active member of the House of Assembly. In 1784 he published a pamphlet in opposition to the government policy of limiting the trade between the West Indies and the United States to English bottoms, in which he maintains that even the welfare of the planter accords with the honour of government and the interests of humanity, in wishing for the total abolition of the slave trade:' an opinion which he recanted after the subject of the slave-trade had been brought before parliament. In 1791 he went to St. Domingo, on the breaking out of the insurrection of the negroes, and acquired the materials for his 'Historical Survey of that island, published in 1797. Afterwards he removed to England, where, in 1796, we find him M.P. for Grampound, which he represented until his death, July 15, 1800.

His principal work, the 'History, Civil and Ecclesiastical, of the British Colonies in the West Indies,' was published in 1793. It treats of the history, constitution, and political relations towards Britain of those colonies; the manners and dispositions of the inhabitants, especially the negroes; the mode of agriculture, and produce. It is a valuable contribution to our literature. The style is somewhat ambitious, but lively and attractive; the matter varied and interesting. The author enters largely into the question of the slave-trade, the cruelty of which he does not attempt to deny, though he is warm in defence of the planters against the charges of cruelty brought against them in England; but his arguments are evidently tinctured by the feeling that, lamentable as it may be, slaves must be had. Mr. Edwards has the merit of having carried a law to prevent cruelties to which slaves in Jamaica were at least legally exposed, whatever the practice might be.

The edition of 1819 contains also the history of St. Domingo, proceedings of the governor, &c., in regard to the Maroon negroes (1796), a continuation of the history down to that time, and one or two other pieces by other hands.

EDWIN, king of Northumbria, was the son of Ella, who appears to have reigned in that kingdom from about A.D. 559 to 589. On the death of Ella, the throne was seized by Edilfrid, or Ethelfrith, the husband of his daughter Acca, and Edwin, an infant, of only three years old, was conveyed to the court of Cadvan, the king of North Wales. Edilfrid on this made war upon Cadvan, and defeated him near Chester, on which occasion it is said that 1200 monks of the monastery of Bangor, who had assembled on a neighbouring hill to offer up their prayers for the success of Cadvan, were put to death by the pagan victor. After this Edwin wandered about for some years till he was, at last, received and protected by Redwald, king of the East Angles. It appears to have been while resident here that he married Cwenburgha, the daughter of Ceorl, king of Mercia. Edilfrid, however, who had made himself by his military success very formidable to all the neighbouring princes, still pursued him, and partly by threats, partly by promises, had nearly induced Redwald to give him up, when (by a miraculous interposition, as Bede would have us believe) more generous counsels prevailed, and the East Anglian king determined to brave the hostility of Edilfrid. Redwald is the fifth in the list of the Bretwaldas, or supreme kings of Britain, as given by Bede; and as he succeeded Ethelbert of Kent, who died in A.D. 616, he probably now held that dignity. The consequence of his refusal to deliver up Edwin was a war with Edilfrid; they met on the right bank of the Idel in Nottinghamshire in A.D. 617, and in a great battle which was there fought Edilfrid was defeated and slain. His children, of whom the names of six are recorded, fled, and Edwin ascended the throne of Northumbria. His valour and abilities eventually acquired for him great power. On the death of his friend Redwald, A.D. 624, he was acknowledged as his successor in the dignity of Bretwalda; and two years after he made war upon the powerful state of Wessex, whose king Cuichelm is accused of having attempted to take him off by assassination, and reduced it for the moment to subjection, though it does not appear that he retained his conquest. Bede affirms that his sovereignty extended over all the English, excepting only the people of Kent, and that he also subjected to his dominions all the Britons, and the Islands of Man and Anglesey. It is probable that he was accounted the leading power among the sovereigns of Britain in his time. Bede says that he was addressed by Pope Boniface as 'Rex Anglorum.' The event for which his reign in Northumbria is chiefly memorable is the introduction of Christianity into that kingdom. The legend is related at great length by Bede in the second book of his History. Of the dreams or visions, the prophecies, and the supernatural visitations, which constitute the greater part of it, it is impossible to make anything in the absence of all other testimony except that of the credulous historian; but the result appears to have been brought about by the exertions of Edwin's second wife, Edilberga, the daughter of Augustine's patron, Ethelbert king of Kent, and of Paulinus, a Roman missionary, whom she had been allowed to bring with her from her father's court. Edwin had long stood out against the per suasions of his queen and Paulinus; but his escape from the attempt against his life by the king of Wessex, and the birth of a daughter, happening simultaneously, powerfully affected him, and Edilberga and her chaplain, taking advantage of the moment of emotion, prevailed with him to call a meeting of his witan to discuss the question of the two religions. When the nobility of Northumbria assembled, Coiffi, the high priest, was himself the first to profess his disbelief in the deities he had been accustomed to serve. This ended the dispute; the chief temple of the idols, which stood at a place still called Godmundham (that is, the hamlet of the enclosure of the God), was profaned and set fire to by the hand of Coiffi; the king and all the chief men of the country offered themselves to be baptized, and the commonalty soon followed their example. Paulinus was made bishop of Northumbria, his residence being established at York, in conformity with the design of Gregory the Great, when the original mission to England was arranged. The archiepiscopal dignity was soon after conferred upon Paulinus by Pope Honorius. Edwin however did not long survive these events. The Mercians, under their King Penda, revolted against the supremacy claimed by Northumbria; and a war which arose in consequence was ended on the 12th of October, 633, by a battle fought at Heathfield, or Hatfield, in Yorkshire, in which Edwin was defeated by Penda and his ally Ceadwalla, king of North Wales, and lost at once his kingdom and his life. His eldest son was slain at the same time; another, whom he also had by his first wife, was afterwards put to death by Penda; and Edilberga, with her children and Paulinus, was compelled to fly to the court of her brother in Kent. One of Edwin's daughters, Eanfled, afterwards married Oswio, a son of Edilfrid, who mounted the throne of Northumbria in 642 and reigned till 670. He defeated Penda, and regained the title of Bretwalda, which Edwin had first brought into his house.

EDWY, called the Fair, king of the Anglo-Saxons, was the eldest of the two sons of Edmund I., but, being only in his seventh or eighth year at his father's death in 946, he and his brother Edgar were set aside for the present in favour of their uncle Edred. On Edred's death in 955, Edwy became king, and his brother appears to have been at the same time appointed subregulus of Mercia. About two years after, the Mercians and Northumbrians rose in revolt, with Edgar as their leader, and a war ensued, which terminated in an agreement between the two brothers that Edwy should retain the country to the south of the Thames, and that Edgar should be acknowledged king of all England to the north of that river. In this revolt Edgar, a mere boy, seems to have been an instrument in the hands of the clerical party, whom Edwy had made his enemies almost from the moment of his accession. In whatever it was that the quarrel began, it soon led to the dismissal of Dunstan and his friends, who had acquired so great an ascendancy in the government in the reign of the preceding king. The writers upon whom we are dependent for the history of this period were all monks, and their testimony is to be cautiously received; but still it is probable enough that they had too much ground for their accounts, which all concur in representing Edwy as a prince of the most dissolute manners, and the kingdom as given up to oppression and anarchy under his rule. The tragical story of Elgiva, as commonly told, is familiar to most readers. Edwy is said to have married this lady, though they were related within the prohibited degrees, and to have incurred the enmity of the ecclesiastics by that violation of canonical law more than by any other part of his conduct. On the day of his coronation, Dunstan tore him rudely from the arms of Elgiva, to whose apartment he had retired from the drunken revelry of the feast; Dunstan's friend, archbishop Odo, subsequently broke into one of the royal houses with a party of soldiers, and, carrying off the lady, had her conveyed to Ireland, after having disfigured her by searing her face with a red-hot iron; and when some time after she ventured to return to England, some of the archbishop's retainers seized her again, and put her to death by the barbarous process of cutting the sinews of her legs with their swords. This story has lately been the subject of some controversy, and the defence of Dunstan and Odo has been undertaken by Dr. Lingard, who does not however deny the main facts of the conduct imputed to them. 'Ham-stringing,' he says, 'was a cruel but not unusual mode of punishment in that age.' He has however made it probable that the lady, whose name seems to have been Ethelgiva, was not the wife but the mistress of Edwy; and, that being the case, he contends that Odo was justified, first, in sending her to Ireland, by a law of king Edward the Elder, which declared that 'if a known whore-quean be found in any place, men shall drive her out of the realm;' and then in having her put to death on her return, inasmuch as 'he believes that, according to the stern maxims of Saxon jurisprudence, a person returning without permission from banishment might be executed without the formality of a trial.' For the full discussion the reader is referred to Lingard's *Antiquities of the Anglo-Saxon Church*; Lingard's *History of England*; Lingard's *Vindication of his History*, 8vo., 18[illegible]; *Letter to Francis Jeffrey, Esq.*, by John Allen, Esq., 8vo., 1827; and the articles on Dr. Lingard's two works in the Edinburgh Review, vol. xxv., pp. 346-354, and vol. xl[illegible], pp. 1-31; both in that letter acknowledged to be by Mr. Allen.

Edwy died in 958, within a year after the pacification with his brother. It is difficult to say whether the expressions of the chroniclers imply that he was murdered, or only that he died of a broken heart. Edgar now became sole king.

EECKHOUT, GERBRANT VANDER, born at Amsterdam in 1621, was a disciple of Rembrandt, whose manner of designing, colouring, and pencilling, he imitated with such felicity, that it is difficult to distinguish some of his paintings from those of his master; and he rather excelled him in the extremities of his figures. His principal employment was for portraits, in which he was admirable, and he especially surpassed all his contemporaries in the power of portraying the mind in the countenance. His master-piece was the portrait of his own father, which astonished even Rembrandt.

But though his excellence in portraits brought him continual employment in that branch, he greatly preferred painting historical subjects, in which he was equally successful. His composition is rich and judicious; and the distribution of light and shade excellent. His back-grounds are in general clearer and brighter than those of Rembrandt; and he was by far the best disciple of that master on the other hand, it must be allowed that he shared in his defects, being incorrect in his drawing, deficient in elegance and grace, and negligent of costume. He died in 1674.

EECKHOUT, ANTHONY VANDER, was born at Brussels in 1656. It is not known under whom he studied; but he went to Italy with his brother-in-law, Lewis Deyster, a very eminent artist, and painted in conjunction with him during his residence abroad; Deyster painting the figures, and Eeckhout the fruit and flowers: yet there was such a harmony in their style of colouring and touch, that their works appear to be all by one hand. Though he was received with great marks of distinction on his return to Brussels, and appointed to an honourable office, he was resolved to leave his friends and country, and the brilliant prospects which he had before him, in order to return to Italy, intending to spend there the remainder of his days. The vessel however chanced to touch at Lisbon, and he was induced to stop in that city. His pictures sold at excessive high prices; and he had made so many sketches of the fruit and flowers in Italy, that he had sufficient for all his future compositions, in which he arranged them with infinite variety and great taste. He had not been above two years in Lisbon, when a young lady of quality and large fortune married him. Unhappily his success and his wealth excited the envy of some miscreants, who shot him as he was taking an airing in his carriage. The assassins were never discovered.

EECLOO. A town and commune in East Flanders, situated on the high road between Bruges and Ghent, about nine miles north-west from Ghent. Eecloo is a place of considerable trade, and contains manufactures of woollen and cotton stuffs, of soap, tobacco, and hats, breweries, distilleries, tanneries, oil-mills, and salt refineries. The weekly market for grain is the largest and best frequented in the province. The town contains 980 houses, mostly well built; there are several public squares, and the streets are well paved. It has two churches, a town-hall, an antient convent, and eight schools. The population is 8350.

EEL. [MURÆNIDÆ.]

EFFENDI is a Turkish word, which signifies 'Master, Monsieur,' and is subjoined as a title of respect to the names of persons, especially to those of learned men and ecclesiastics, e. g. *Omar Effendi*, *Ahmed Effendi*, in the same manner in which *Agha* is placed after the names of military and court officers. The word Effendi occurs also as part of some titles of particular officers, as *Reis Effendi*, the title of the principal secretary of state, and prime minister of the Ottoman empire, which is properly an abbreviation of *Reis-al-Kottâb*, *i.e.*, 'the head or chief of secretaries or writers.'

EFFERVESCENCE is the rapid disengagement of a gas taking place in a liquid in consequence of chemical action and decomposition; it is most commonly applied to the effect produced by adding an acid to a carbonate, by which numerous bubbles of carbonic acid gas rise to the surface of the liquid, and forming a frothy head burst with a hissing noise. Fermentation is accompanied with a slower kind of effervescence; and when metals are dissolved in acids, gaseous matter is frequently formed and expelled with considerable force. Its nature depends upon that of the acid and metal employed: thus when diluted sulphuric acid is poured upon iron, the effervescence is owing to the escape of hydrogen gas from the decomposition of water; when, on the other hand, dilute nitric acid is poured upon copper, nitric oxide gas is liberated.

EFFLORESCENCE is the property by which certain salts containing water of crystallization lose it, and become opaque by exposure to the air; in some cases, salts which do not contain much water preserve their form, whilst others which contain a large quantity are not only rendered opaque, but lose their crystalline figure, and become powdery by efflorescence: such are sulphate and carbonate of soda.

The efflorescence of some salts may be prevented by varnishing or oiling them. It has also been observed by Professor Faraday that the property of efflorescence appears in some cases to depend upon the superficial fracture of the crystal: thus he found that crystals of carbonate, phosphate, and sulphate of soda, having no parts of their surfaces broken, and carefully preserved from external violence, remained perfect; but upon breaking or scratching their surfaces efflorescence began at that part, and eventually extended all over the crystal.

EGBERT, styled the Great, king of the West Saxons, was, according to the Saxon Chronicle, the son of Alchmond, whose descent is traced up through Esa, or Eata, and Eoppa, to Inigisil, or Ingild, the brother of the great Ina, and the undoubted descendant of Cerdic. The Chronicle states Alchmond to have reigned in Kent; but this point, as well as the whole of the genealogy of Egbert, must be considered as doubtful. All that can be certainly affirmed is, that he was of the blood of Cerdic, and that he eventually came to be regarded as the representative, if not the only remaining male descendant, of that founder of the royal house of Wessex. When Beohrtric, or Brihtric, became king in 786, Egbert, then very young, or his friends for him, had claimed the throne. Brihtric is said to have soon after made an attempt on his life, upon which he took refuge at the court of Offa, the powerful king of Mercia. After a short time however he lost Offa's protection, on Brihtric marrying Eadburga, the daughter of that king. Egbert then fled to France, where he was received by the Emperor Charlemagne, and at his court he abode till the death of Brihtric in 800. He was then recalled, and by the unanimous vote of the witan appointed to the vacant throne. William of Malmsbury, who wrote in the twelfth century, is the only authority for this history of Egbert's early life. He says, that besides other accomplishments he learned the art of war under Charlemagne, in whose armies he served for three years.

At the date of Egbert's accession the Saxon states in England were reduced to three independent sovereignties; Northumbria, comprehending what had occasionally been the separate kingdoms of Deira and Bernicia; Mercia, which had reduced to subjection Kent, Essex, and East Anglia; and Wessex, with which Sussex had become incorporated. Of these three powers, Northumbria was torn by internal dissensions, and probably was indebted for the preservation of its independence chiefly to the rivalry between the other two. The conquests and the able rule of Offa however had raised Mercia to a decided pre-eminence over Wessex; and at this time the Mercian throne was occupied by Cenwulf, who was well qualified to wield the sceptre of Offa, and who had even extended the territory which he had inherited from that king. The two states were at war when Egbert became king; but a peace was soon concluded between them; and so long as Cenwulf lived Egbert made no attempt at conquest over any part of Saxon England. For the first nine years of his reign indeed he seems not to have drawn his sword. He then (A.D. 809) engaged in war against the alien tribes that still remained unsubdued in the west; and between that year and 814 he is recorded to have subjugated, or at least overrun and reduced to temporary submission, all Cornwall (including Devon) and South Wales. But soon after the death of Cenwulf in 819 we find him entering upon a new career. In 823 a dispute about the succession to the Mercian crown raised the East Angles in revolt; Egbert's aid, upon being applied for, was readily given to the insurgents; and a great battle took place at 'Ellerdune,' supposed to be Wilton, which ended in the complete defeat of the Mercians. Essex and Kent were immediately seized by Egbert, or voluntarily submitted to him. The East Angles in the mean time he professed to leave independent; and Mercia itself he did not think yet sufficiently weakened to be attacked with effect. A continuance of the dispute about the succession, however, and another revolt of the East Angles (which he probably fomented), soon produced the state of things he waited for. In 827 he marched against Mercia; Wiglaf, the king, fled, on his approach, to the monastery of Croyland; but soon after made his submission, and was permitted to retain his kingdom as the vassal or tributary of Egbert. East Anglia Egbert appears to have now taken under his own immediate government. He is affirmed by Bede to have subjected to his rule all England to the south of the Humber. Without loss of time also he led his army against the Northumbrians; their king Eanred offered no resistance, but, meeting Egbert at a place called Dore, to the north of the Humber, acknowledged him as Bretwalda. He is the eighth Saxon king who is stated to have acquired this dignity; the last was the Northumbrian king Oswio. [EDWIN.]

In the last year of the reign of Egbert several of those descents of the Danes or northern pirates were made upon the English coasts, which produced so much public confusion and calamity when renewed in the times of his son and his grandsons. In 832 they ravaged the Isle of Sheppey; and next year, appearing with a fleet of five-and-thirty sail in the river Dart, they landed and defeated a force that Egbert sent against them. When they returned however in 835, and landed in Cornwall, they and a number of the people of that district whom they had induced to join them, sustained a decisive overthrow from the king of Wessex in person. Egbert died the next year, after a reign of thirty-seven years and seven months; leaving his dominions between his son Ethelwulf and Athelstane, whom some of the chroniclers make the son, others the brother, of Ethelwulf. [ETHELWULF.]

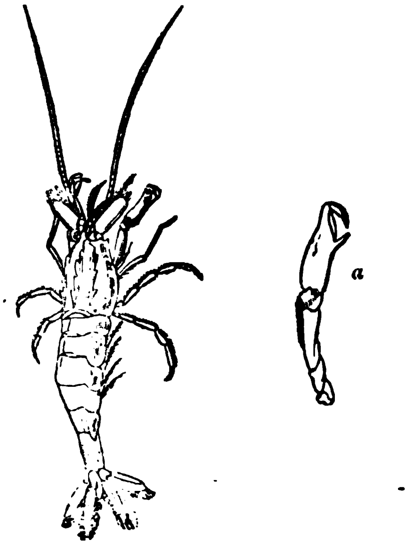
Egbert is commonly said to have been the first Anglo-Saxon king who called himself king of the Angles or of England; but only one charter is known to exist in which he is styled Rex Anglorum. In general both he and his successors down to Alfred inclusive call themselves only kings of the West Saxons. And although Egbert asserted a supremacy over the other states, which remained ever after with his kingdom of Wessex, it is to be recollected that he did not incorporate either Mercia or Northumbria with his own dominions. It does not appear that he even assumed to himself the appointment of the kings of those states. The reigning families seem to have continued in possession, with merely an acknowledgment of his supremacy as Bretwalda. (See Turner's *A. Saxons*, I. 422.)

EGEON (zoology), Risso's name for a genus of macrourous decapods, whose characters are generally like those of *Crangon* (shrimp), but with the following differences. The fourth or last visible joint of the external *jaw-feet* is nearly twice as large as the preceding. The *feet* of the second pair are extremely short, slender, and didactylous; those of the third long, very slender, and terminated by a single nail; those of the fourth and fifth pairs larger, and ending by a compressed nail. The *carapace* elongated, cylindrical, spinous, and terminated anteriorly by a small *rostrum*.

The extreme brevity, observes Desmarest, of the second pair of feet, and the roughness of the carapace, are the most remarkable of these differences; but they do not, in his opinion, present characters sufficient for the establishment of a genus. Example, *Egeon loricatus*, Risso (crust.); *Pontophilus spinosus*, Leach. (See *Trans. Soc. Linn.*, t. xi., p. 346, and *Malac. Brit.*, tab. 37 A.)

Description.—*Carapace* supporting three longitudinal dentelated carinæ above; *rostrum* very short; total length about an inch and a half. Locality, coasts of England, those of Nice, and the Adriatic Sea.

The term *Egeon* is used by Denys de Montfort for one of the *Nummulites*—*Nummulina*, D'Orbigny.



Egeon loricatus. a, left foot of the first pair magnified.

EGER, a river of Bohemia, which, soon after it quits the Fichtelberg, in Bavaria, where it has its source, enters the west of Bohemia at Hohenberg, and flows eastwards until it reaches Theresienstadt, where it joins the Elbe: from the point of their confluence the Elbe becomes navigable. The length of the Eger, from Hohenberg to Theresienstadt, is about 80 miles; it has a fall of 158 ft. between the frontier and the Elbe; its banks are high, and its bed is hard and stony. The circle of Eger, in the greater circle of Ellbogen, in Bohemia, is the most western point of that kingdom; it contains an area of about 105 square miles, and about 24,000 inhabitants.

EGER (in Bohemian CHEB or CHEBBE) is situated on a rocky eminence on the right bank of the river of the same name, in 50° 5′ N. lat. and 12° 24′ E. long. In former days it was strongly fortified; but most of its defences have been levelled, and the ditches have been filled up. It has about 800 houses and 9500 inhabitants. There are several handsome buildings in the town, among which are the deaconry church, six other churches, the spacious town-hall, a Dominican and a Franciscan monastery, and the barracks, formerly a Jesuits' college. Eger has likewise a high school or gymnasium, a military seminary for boys, a head national school (*haupt-schule*), two hospitals, an infirmary, and an orphan asylum. There is an apartment in the burgomaster's residence, in the market-place, in which the celebrated Austrian commander, Wallenstein, was assassinated in the year 1634; and in the town-hall are some paintings which depict the violent deaths of that leader and his adherents. The ruins of the 'Steinhaus' (house of stone), the former residence of the margraves of Vohburg, to whom Eger once belonged, are remarkable for an antient square tower of black rusticated freestone. There are several manufactures, principally of woollens and kerseymeres, cottons, leather, soap, meal, alum, and fire-engines; and the town has a transit trade with the neighbouring German states. About 3 miles to the north of Eger are some saline hot-wells, opened in 1793, and called 'The Emperor Francis's Baths;' they are much frequented in the summer season, and rendered attractive by the beauty of the surrounding scenery. About 15,000 dozen bottles of the waters are annually exported.

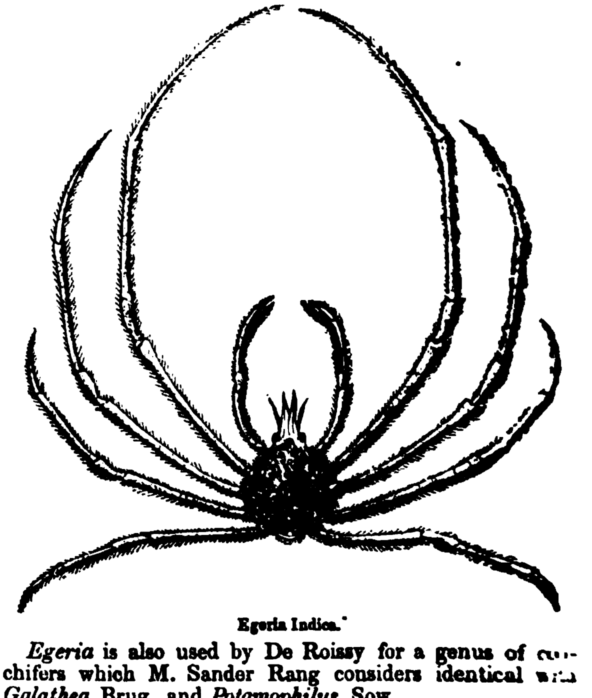
EGE'RIA (zoology), a genus of brachyurous decapod crustaceans established by Leach, and thus characterized.

External *antennæ* short, inserted on the sides of the *rostrum*, having their second joint much shorter than the first. External *jaw-feet* having their third articulation straight on the internal border, and terminated by a point. *Claws* delicate, linear, double the length of the body in the males, nearly equalling it in the females, much shorter in both sexes than the rest of the feet, which are very slender, those of the fifth pair being five times the length of the body. *Carapace* triangular, tuberculated, and spinous, terminated by a rather short rostrum, which is bifid, with diverging points. *Eyes* much larger than their peduncle. *Orbits* having a double fissure on their superior border.

Desmarest observes that this genus, somewhat hastily established by Leach, if the number of articulations of the abdomen in the species which compose it were seven, would be nearly approximated to *Maia*, *Pisa*, *Mithrax*, and *Micippa*, in the form of the body; but the difference lies in the delicacy and disproportioned length of the feet. If the number of articulations composing it be six, as there is room for believing, although neither Latreille nor Leach say so positively, it would bear great relationship to the long-legged genera, *Macropodia*, *Leptopodia*, and *Doclea*, for example. But it has not the long, slender, divided rostrum, as well as the long claws larger than the feet, which characterize the first; nor does it present the very long, very slender, and entire rostrum, as well as the very elongated and linear claws, of the second; and finally, it has not the globular body and the very short and delicate claws of the last. It is removed from *Inachus* by the claws, which are proportionally shorter and less thick than those of the last named crustaceans, by the other feet, which are relatively longer than theirs, by the antennæ, of which the two first joints of the base, and not the third, are longer than the others, and by the double fissure of the bottom of the orbits above.

Example, *Egeria Indica*.

Description. In size, general form of the body, and length of the feet, bearing a great resemblance to *Inachus Scorpio*; but besides the generic differences pointed out, it is still further removed from it in having a larger rostrum, which is deeper incised in the middle, and in having the points with which the elevated and distinct regions of the carapace above are beset, disposed in the following order: 3, 2, 1 and 1. A rather long, sharp, post-ocular point is directed forwards. The arms are rather short and slender. Locality, the Indian Seas.



Egeria Indica.

Egeria is also used by De Roissy for a genus of conchifers which M. Sander Rang considers identical with *Galathea*, Brug., and *Potamophilus*, Sow.

EGERTON, FRANCIS. [BRIDGWATER, DUKE OF.]

EGG PLANT, the Solanum Melongena of botanists, is a native of the north of Africa, and was introduced to this country in the year 1597.

It grows to the height of two, or two and a half feet, has leaves of an ovate form, which, as well as the stem, are prickly and downy; its flowers are generally of a violet colour, and its fruit is a large ovate or globose berry resembling a hen's egg, or sometimes larger; whence the name of egg plant, which has been given to it.

There are many varieties of this plant, of which two only are commonly cultivated in gardens, namely the small white and the large purple. They are raised from seed, which should be sown early in spring, in light soil on a hot-bed, and treated in every respect like a tender annual. After the plants are strong enough they must be taken up and potted, and regularly shifted when necessary into pots of a larger size. They may either be allowed to fruit in flower-pots in an airy green-house or vinery; or they may be planted out in June in a warm border on the south side of a wall, where they will have the benefit of the reflected rays of the sun. Of the two varieties above mentioned, which by some botanists are regarded as distinct species, that with white fruit is small and rather an object of curiosity than of use; the other, with purple fruit, which sometimes attains a pound weight, is a favourite article of food in hot countries; under the name of Brinjal and Begun it is well known in India, and by that of Aubergine in France. The fruit is brought to table boiled or fried, or in stews; and if well cooked is delicate and agreeable; but it is necessary in the first instance to deprive it of a bitter nauseous acrid juice, or it is unfit for food; and as the cooks of this country do not generally understand the art of doing this, the egg-plant is here very seldom seen on the table.

It is said by those who have visited China that the Chinese, on days of festivity, cook this fruit while hanging on the plant, and in that way introduce it to table.

EGHAM. [Surrey.]

EGINHARDT, a native of Austrasia or East France, was instructed by Alcuinus, and by him introduced to Charlemagne, who made him his secretary, and afterwards superintendent of his buildings. His wife Emma, or Imma, is said by some to have been a daughter of that prince, and a curious story is related of their amours previous to their marriage, but the whole seems an invention. Eginhardt himself does not reckon Emma in his enumeration of the children of Charles. After the death of that monarch, Eginhardt continued to serve his successor, Louis le Débonnaire, who entrusted him with the education of his son Lotharius. But after a time Eginhardt resigned his offices, left the court, and withdrew to the monastery of Fontenelle, of which he became abbot; his wife also retired into a nunnery. After remaining seven years at Fontenelle, he left it, about A.D. 823, and went to another monastery, but in 827, having received from Rome the relics of the martyrs Marcellinus and Petrus, he placed them in his residence at Mulinheim, which he converted into an abbey, which took afterwards the name of Seligenstadt, where he fixed his residence. (*De Translatione SS. martyrum Marcellini et Petri*, in the *Acta Sanctorum* of Bollandus. The account is written by Eginhardt.) Eginhardt seems to have still repaired to court from time to time, when his advice was needed, and he appears by his own letters to have endeavoured to thwart the conspiracy of Louis's sons against that unfortunate monarch. He spent his latter years in retirement and study: he was still living in 848, but the time of his death is not ascertained. His wife had died before him, a loss by which he was greatly grieved, although they had lived separately for many years. Eginhardt wrote, 1. 'Vita et Conversatio gloriosissimi Imperatoris Karoli Regis magni,' divided into two parts, one relating to the public and the other to the private life of his hero. It has gone through many editions, and has been also translated into various languages. The style is remarkably good for the times. 2. 'Annales Regum Francorum, Pipini, Karolimagni, et Ludovici Pii, ab anno 741 ad annum 829.' 3. 'Epistolae,' which are found in Duchesne's 'Historiae Francorum Scriptores,' vol. ii. These letters, of which only sixty-two have been preserved, show Eginhardt's character to great advantage, and afford considerable information on the manners of that period. 4. 'Breviarium Chronologicum ab orbe condito ad ann. D. 832,' which is an abridgment of Beda's Chronicle. There is a notice of Eginhardt by Duchesne, prefixed to his life of Charlemagne, in the collection already mentioned.

EGLANTINE, the old English name of the Sweet Briar Rose; aiglantier and eglantier in French. Milton misapplies the word to the Honeysuckle in the following lines:—

'Through the Sweet Briar, or the Vine,
Or the twisted Eglantine.'

EGMONT, Count of Lamoral, Prince of Gavre, a descendant of the old dukes of Gueldres who had signalised themselves against the house of Austria, was born in 1522 in Amsterdam. The fame of his ancestors is celebrated in the annals of his country, one of whom enjoyed, during the reign of Maximilian, the supreme magistracy of Holland.

Egmont's marriage with Sabina, duchess of Bavaria, reflected additional lustre upon his noble birth, and increased his influence by powerful alliances. In the year 1546 Charles V. conferred upon him the order of the *Golden Fleece*. Under this emperor he learned the art of war, and, being appointed by Philip II. commander of the cavalry, he gathered his first laurels in the fields of St. Quentin and Gravelingen (1557, 1558).

The Flemish people, chiefly occupied with commerce, and indebted for the preservation of their prosperity to these victories, were justly proud of their countryman, whose fame was spread through all Europe. The circumstance of Egmont being the father of a numerous family served also to increase their affection, and they saw with delight the prospect of this illustrious family being perpetuated among them.

Egmont's demeanour was courteous and noble; his open countenance was an index of the singleness of his mind; his religion was one of mercy and philanthropy; far from being a bigotted Romanist, or a reckless reformer, he elevated himself above the contending parties, and laboured to bring about a peaceful reconciliation. It was only towards the close of his life, when all attempts to disarm the fury of the Spaniards against his Protestant countrymen had failed, that he showed himself willing to defend them against their oppressors. His motives however were not any predilection for the Protestant doctrine, but pure love of justice, peace, and humanity.

A man possessed of such qualities, and enjoying so much popular influence, naturally awoke suspicion and jealousy in the heart of the Spanish despots whenever the interests of the Flemish came into collision with those of the crown. Philip however, in order to conceal his dark designs against the supposed protector of the religion of his rebellious subjects, on visiting Brabant gave to Egmont the government of Artois and Flanders, and exempted his estates from taxation. But upon his return to Madrid the tyrant changed his plans, and sent his favorite, Alva, to Flanders, with instructions to get rid of Egmont and his friend Count Horn.

In order to secure them both Alva invited them to dinner, under the pretence of wishing to consult them on public affairs. When they had entered his private room, they were seized, and thrown into prison in Ghent, where they remained during nine months. At the expiration of this time they were carried to Brussels under an escort of ten companies of Spanish soldiers. Here Alva, invested with the power of captain-general and supreme judge, compelled the criminal court to pronounce Egmont guilty of high treason and rebellion, and to sentence him to be beheaded. This sentence was pronounced on the 4th June, 1568, without any substantial evidence, and was supported only by the depositions of his accusers. His estates were also confiscated. During his imprisonment the emperor of Germany, the knights of the Golden Fleece, the electors, the duchess of Parma, and his wife, used every possible exertion to save his life; but Philip was immovable. The sentence was executed on the 5th of June, 1568, and both Egmont and Horn fell by the sword of the executioner on a scaffold in one of the principal squares of Brussels. Egmont died with courage, after having written a dignified letter to the king and a tender one to his wife.

He was but 46 years of age. The people, who assembled in crowds to witness this mournful spectacle, were loud in their lamentations; they rushed towards the scaffold and dipped their handkerchiefs in the blood of the martyrs of Flemish independence. His friend, Count Horn, was executed immediately after him. Egmont's wife died the 19th of June, 1578. It is said that the bishop of Ypres, a most pious and upright prelate, who had been deputed by Alva to prepare the two prisoners for their execution, after hearing the confession of Egmont, was so persuaded of his innocence that he went to Alva and begged him on his knees to suspend the execution. But Alva, besides his natural ferocity, bore a mortal enmity to Egmont on account of his military reputation, and rejected the bishop's intercession with insolent contempt. When Philip II. heard that these two noble lords had been executed he exclaimed, 'I have caused these two heads to fall because the heads of such salmons are worth more than many thousand frogs.'

The death of Egmont has supplied to Goethe an admirable subject for one of the best of his historical tragedies, for which Beethoven composed one of his finest overtures and some beautiful melodies to the songs interspersed through the play.

The latest life of Egmont is that by Clouet, *Éloge historique du Comte d'Egmont*, Bruxelles, 1825.

EGREMONT. [CUMBERLAND.]

EGRIPOS. [EUBŒA.]

EGYPT AND EGYPTIANS. Egypt, Mizr or Mizraim in Hebrew, Masr in Arabic, and Chamî or Chemî in Coptic, is generally reckoned within the limits of Africa, though several geographers have considered it as physically belonging to Asia. It is bounded on the north by the Mediterranean, on the east by the little river of El Arish on the borders of Palestine and the Syrian or Arabian desert, which extends from the Mediterranean to the Gulf of Suez, and from thence southwards by the west coast of the Red Sea, and on the west by the Libyan desert. To the south its boundary from the oldest time has been fixed at the rapids or cataracts of Assouan, the antient Syene, which are formed by a number of granite rocks that lie across the bed of the river. The fall of the water, however, is only a few feet, and boats can easily pass down the rapids. But the political limits of Egypt have extended both in antient and modern times further south along the valley of the Nile into the country known by the general name of Nubia. The length of Egypt from the cataracts of Syene 24° 8′ N. lat. to the most northern point of the Delta on the Mediterranean 31° 25′, measures on the map about 500 English miles. But the length of the cultivated parts of Egypt, or valley of the Nile, is considerably greater, owing to the numerous bends of the river, which give it a course of about 500 miles from Assouan to a few miles north of Kahira or Cairo, where the valley terminates: this estimate is exclusive of the length of the Delta, which is nearly 100 miles more. The breadth of Egypt is difficult to determine. As to its physical boundaries it may be considered to extend from the shores of the Red Sea to the range of hills which bounds the valley of the Nile to the west; it may even be extended over the western desert as far as the Oases which are dependencies of Egypt; or it may be restricted to the breadth of the cultivated land in the valley of the Nile and Delta, which are the only parts, excepting the Oases, where there is a settled population. We may therefore consider Egypt under each of these four great divisions: 1. The valley of the Nile; 2. The Delta; 3. The western desert and the Oases therein inclosed; 4. the Eastern country towards the Red Sea.

1. *Valley of the Nile.* The Nile coming from Nubia runs through a deep and narrow valley, sunk between two ridges of rocky hills which rise in some places above 1000 feet above the level of the river. The breadth of the valley varies considerably, but it is seldom more than ten miles, and in many places, especially in Upper Egypt, it is not two, including the breadth of the river, which varies from 2000 to 4000 feet. In its course within Egypt the Nile contains numerous islands. From Assouan to Selseleh, a distance of about 40 miles, the river runs nearly in the middle of the valley, leaving little cultivable land on each side. As we advance farther north the western ridge recedes from the river, so as to leave a space of several miles between the left bank and the foot of the hills, while the east chain keeps closer to the corresponding or right bank of the Nile. North of Keneh the river forms a great bend to the west and north-west as far as Minyeh, near which it reaches it westernmost point, which is about 120 miles to the west of the longitude of Keneh; it then inclines again to the north-east as far as Benisouef and a few miles beyond it, after which it assumes a course nearly due north as far as the apex of the Delta. From Farshout, half way between Keneh and Girgeh, a canal runs parallel to and west of the course of the Nile, under the different names of Moye Souhadj, Bahr Joussouf, &c., for about 250 miles to Benisouef, where an opening in the western ridge allows a branch of it to pass into the district of Faioum, which it irrigates and fertilizes. Its surplus waters then flow into the Birket-el-Keroun, the antient Mœris lake. [BIRKET-EL-KEROUN and FAIOUM.] Another branch of the Bahr Joussouf continues to follow the course of the Nile northwards as far as the Delta. The Bahr Joussouf, from Ashmouncin to Benisouef, runs at the distance of three to six miles from the Nile; the western ridge being here from eight to ten miles from the Nile, and near Benisouef fifteen miles distant from it. The banks of the Bahr Joussouf, like those of the Nile, are raised higher than the rest of the valley. Consequently between the canal and the Nile there is a kind of depression. On the other or west side of the canal there is a strip of cultivated land as far as the inundation or artificial irrigation extends, beyond which and to the foot of the ridge there is a strip of sand, light and drifting in the neighbourhood of the cultivated ground, upon which it seems to encroach in many places, and coarser and mixed with pebbles near the base of the hills. Consequently the cultivable land along the banks of the Nile, both to the east and to the west of the river, by no means occupies the whole breadth of the valley. The Bahr Joussouf appears to be the same as the Oxyrbynchus canal of antient times, which Strabo, while sailing along it, mistook for the Nile itself, on account of its magnitude. North of Benisouef, the western range, the height of which becomes less and less as it advances northwards, again approaches the river near Sakkarah, and forms in the neighbourhood of Jizeh a kind of natural terrace, on which the great pyramids stand. The ridge then continues to skirt the western or Rosetta branch of the river as far as the neighbourhood of the Canal Bahireh, which once communicated with the lake Mareotis. The ridge here inclines to the west, and may be considered as joining the hills which skirt the valley of the Natron lakes. [BAHR BELA-MA.] The general character of the western ridge which borders the valley of the Nile is a limestone formation which contains numerous fossil shells. The great pyramid is built of this kind of stone. In the neighbourhood of Esneh, in Upper Egypt, a sandstone formation commences, alternating with limestone, but the mountains contain also slate and quartz of various colours. The great slabs used in the construction of the temples of Egypt, with the exception of those of the Delta, were of sandstone, as well as many of the sculptures or statues. In the neighbourhood of Selseleh are extensive quarries of sandstone.

The mountain range on the eastern side differs in some respects in its geological character from the western ridge, and it generally rises more abruptly, and often close to the edge of the river. From Mount Mokattem, near Cairo, the limestone extends southwards, though with many interruptions, as far as on the western side of the Nile. But the serpentine and granite appear to commence earlier, and to characterize the eastern more strongly than the western side. Near Assouan the granite alternates with the decomposed sandstone, exhibiting an irregular and broken appearance, which has sometimes been compared to a ruin. On the east side of the Nile, near Syene, scattered at the foot of the mountains, and occasionally close to the river, are those extensive granite quarries which furnished the antient Egyptians with materials for their colossal statues and obelisks.

The eastern range leaves the banks of the Nile at a higher or more southern point than the west ridge. From Mount Mokattem, near Cairo, it turns off abruptly to the east, and under the name of Jebel Attaka runs to the Red Sea, near Suez. North of it the sands of the desert of Suez spread close to the eastern skirts of the Delta.

2. *The Delta.* The Nile issuing from the valley a few miles north of Cairo, enters the wide low plain which, from its triangular form and its resemblance to the letter Δ, received from the Greeks the name of the Delta. The river divides into two branches, that of Rosetta or Canopic, and that of Damiat or Phatnitic. The figure of the Delta is now determined by these two branches, although the cultivated plain known by that name extends considerably beyond to the east and west, as far as the sandy desert on each side. In antient times the triangle of the Delta was much more obtuse at its apex, as its right side was formed by the Pelusiac branch, which, detaching itself from the Nile higher up than the Damiat branch, flowed to Pelusium, at the eastern extremity of Lake Menzaleh. This branch is now in great measure choked up, though it still serves partly for the purpose of irrigation. West of the Pelusiac branch the Moes canal corresponds with the Tanitic or Saitic branch of the antients, and the Menzaleh canal with the Mendesian branch; they both enter Lake Menzaleh, a vast salt marsh, forty miles long, which communicates with the sea by several outlets. (Andreossi, *Memoir on Lake Menzaleh*, with *Map* of the same in the great French work on Egypt.) Between the Damiat and the Rosetta branch are numerous canals, large and small,

inundating the country in every direction. Along the sea-coast is another salt lake or marsh, called Bourlos, communicating with the sea by an outlet, which is probably the same as the Sebennytic mouth of the ancient geographers. Proceeding westward we meet with the Rosetta or Bolbitine mouth, which with that of Damiat are now the only two entrances from the sea into the Nile, and they are accessible only to small vessels. The Nile at Rosetta is 1800 feet wide, and at Damiat only 900 feet. West of Rosetta, a salt marsh, called Lake Edko, has been formed, which communicates on one side with the Nile, and on the other with the sea or Aboukir Bay, by an outlet which corresponds to the old Canopic mouth. West of Lake Edko is the lake of Aboukir, which likewise communicates with the sea, and is divided from Lake Mareotis to the south-west of it by an isthmus along which passes the canal of Alexandria, which has been restored by Mohammed Ali. [ALEXANDRIA; BOGHEIREH; MAREOTIS.] The greatest breadth of the Delta, or cultivated plain of Lower Egypt, is about eighty miles from east to west; its length from the bifurcation of the river to the sea is about ninety. The interior of this country, which is covered with fields, orchards, and plantations, exhibits different aspects according to the various seasons. The rise of the Nile occasioned by the periodical rains of Central Africa, begins in June about the summer solstice, and it continues to increase till September, overflowing the lowlands along its course. The Delta then looks like an immense marsh, interspersed with numerous islands, with villages, towns, and plantations of trees just above the water. Should the Nile rise a few feet above its customary elevation, the inundation sweeps away the mud-built cottages of the Arabs, drowns their cattle, and involves the whole population in ruin. Again, should it fall short of the ordinary height, bad crops and dearth are the consequences. The inundations having remained stationary for a few days, begin to subside, and about the end of November most of the fields are left dry, and covered with a fresh layer of rich brown slime: this is the time when the lands are put under culture. During our winter months, which are the spring of Egypt, the Delta, as well as the valley of the Nile, looks like a delightful garden, smiling with verdure, and enamelled with the blossoms of trees and plants. Later in the year the soil becomes parched and dusty; and in May the suffocating Khamseen begins to blow frequently from the south, sweeping along the fine sand, and causing various diseases, until the rising of the beneficent river comes again to refresh the land. Showers are very rare in Egypt, except on the sea-coast; it rains three or four times in the year at Cairo, and once or twice in Upper Egypt, but perhaps not every year. The nights however are cool, and the dews heavy. Strong winds blow from the north during the summer, at the period of the inundation, and are very useful to propelling vessels up the Nile against the current.

It is generally presumed that the Delta has been formed or at least considerably enlarged by the alluvial soil of the Nile. This was already the belief in the time of Herodotus. The advance of the coast since then does not appear to have been very great, if we may judge from the position of the old towns mentioned by the Greek geographers: on the site of Tamiathis, the old Damietta, the sea has not retired above two miles. The time in which the Delta may be supposed to have been a *gulf* of the sea must be placed long previous to the historical period. At present it is ascertained that the coast of the Delta does not advance, but the currents which sweep along the north coast of Africa must prevent any permanent accession of alluvial soil to the Egyptian shore. The gradual elevation of the soil of the Delta and valley of the Nile has also been much exaggerated. It does not appear to have risen above seven or eight feet since the time of the Ptolemies, and the bed of the river has also risen in proportion. The height of the inundation requisite for the irrigation of the land, making allowance for the difference of measures, appears to be nearly the same as in the time of Herodotus. (Wilkinson, ch. vi., pp. 312, &c.) The vertical increase of the cultivated soil must not be confounded with the accumulation of sand in some particular places, as round the great sphinx, &c., which has been in many instances the work of the wind.

3. *The Western or Libyan Desert.*—The nominal limits of Egypt along the sea-coast west of Alexandria are the mountains of Akabah el Solloum, the Catabathmus Magnus of the ancients, about 25° E. long., where the nominal limits of the pachalik of Tripoli begin, but this extensive tract of country is occupied by independent tribes of nomadic Arabs. Inland to the south is the oasis of Siwah or of Ammon described by Hornemann, which is now considered as within the political limits of Egypt, and pays tribute to it. [SIWAH.] Farther to the south-east, and nearer to the valley of the Nile, is a succession of oases, beginning with the Little Oasis, now called Wah el Bahryeh or Wah el Behnesa, having been colonized by people from Behnesa or Oxyrhynchus. The chief town or village is El Kasr, about 28° 16' N. lat. and 28° 55' E. long. It is three caravan days' journey south-west of Faioum across the desert. This Wah is fertilized by irrigation from plentiful and never-failing springs; it produces wheat, rice, barley, clover, liquorice, and a variety of fruit trees. It pays a tribute of 25,000 [illegible] about 60*l.* sterling, and has an armed force of several hundred men for maintaining the police. A short day's journey to the south of it is the small Wah of El Hayz, and three days further south is that of Farafreh, with about seventy inhabitants, the rest having been kidnapped some years since by a party of roving blacks from the west. About five or six days west of the road to Farafreh, some say three days due west of the oasis of Dakhleh, is another oasis, called Wady Zerzoora, abounding in springs and palms. It was discovered about ten years since by an Arab in search of a stray camel, and from the footsteps of men and sheep he met with is believed to be inhabited. Gerhabo, another Wah, lies six days still farther to the west, and twelve days from Augila: the inhabitants are said to be black, probably Tibboos, and are far removed beyond the dominion of Egypt. Four days south of Farafreh is the Wah of Gharbee, or Wah el Dakhleh, which, although mentioned by Arab writers, was unknown to Europeans till discovered by Sir A. Edmonstone in 1819. It has however a temple of Roman date, with the names of Nero and Titus upon it. The condition and population of this oasis is superior to those of the others already mentioned: it contains eleven villages or towns, and a population of 6000 male inhabitants. It abounds with fruit, particularly olives and apricots; but dates, as in all the oases, form the principal produce of the district. The principal village, El Kasr Dakhel or Dakhleh, is in about 25° 25' N. lat. and 28° 55' E. long., nearly three degrees west of Thebes. There is a warm spring, of the temperature of 102 Fahr., which supplies several baths attached to the mosque. The people are hospitable, and neither so ignorant nor so bigoted as those of the Little Oasis. Three days to the eastward of Dakhleh, in the direction of Esneh, is the Great Oasis, or Wah el Khargeh. It extends in length from 24° 30' to near 26° N. lat., and has many villages and springs, as well as ruins of the ancient Egyptian time, of the Roman period, and of the Christian and the Saracenic eras. Several roads lead from the Great Oasis to the Nile, to Esneh, Siout, Farshout, and Thebes. The road to Dar-fur passes through it. This oasis, as well as that of Dakhleh, are nearly on the same level as the valley of the Nile, while the Little Oasis is about 200 feet higher than the Nile in the latitude of Benisouef. (Wilkinson's *Thebes*, ch. vi.) The Great Oasis has been described by Browne, who visited it on his way to Dar-fur.

4. *The Eastern Country.*—The large tract between the valley of the Nile and the Red Sea has a different character from the western or Libyan desert. Its general character is that of a mountainous region, which, although generally rocky and barren, is intersected by numerous wadys or ravines, fertilized by springs and clothed with vegetation. Several Arab tribes divide among themselves the whole tract, which cannot therefore be called properly a desert. These tribes are,—the Maazy, east of Benisouef; the Atooni and the Beni Wasel (south of the Maazy); and the Ababdeh, farther south, towards Nubia. In ancient times the roads leading from the valley of the Nile to the shores of the Red Sea passed by regular stations, and villages and towns with a resident population. Mines of various metals and quarries of porphyry and other valuable stones are scattered among the mountains, and were once regularly worked. At present, the only fixed habitations are at the port of Cosseir, and at the Coptic monasteries of St. Anthony and St. Paul. The road to the latter leads from the east bank of the Nile, opposite Benisouef, along an undulating plain or broad valley, called Wady Araba, which extends nearly due east to the Red Sea, between two ridges of mountains both called Jebel Kelalla; the south range is also called

Kolzim, and projects into the sea at Zaffarana Point, south of the bay of that name, about 28° 55′ N. lat. The distance from the Nile to the Red Sea is here about 90 miles. The convent of St. Anthony is about 17 miles from the shore of the Mersa, or bay of Zaffarana, which terminates the wady Arabah. The patron and founder of the order is St. Anthony of Thebes, who lived in the time of Constantine. The monks have two very fine gardens, which, as well as the convent, are surrounded by high walls to protect them from the Arabs. From St. Anthony to Deir Bolos, or St. Paul, is a distance of about 14 miles by the road. The Kolzim ridge lies between the two. Deir Bolos is only 9 miles from the sea to the south-east of Deir Antonios, and at Wady Girfi between it and the sea are the remains of houses and catacombs which appear to belong to the Greek period. (Wilkinson's *Notes on a part of the East Desert of Upper Egypt*, with *maps*; in the 2nd vol. of *The Journal of the Royal Geographical Society of London.*) The Convent of Deir Bolos appears to be wealthier and finer than that of Deir Anthony, but the monks are fewer in number: both live chiefly on vegetables and fish. From Deir Bolos Mr. Wilkinson proceeded southwards, between the Kolzim range and the sea, to Jebel Tenesep, about 15 miles south-east of Deir Bolos, where the mountains diverge into the interior to the south and south-west towards the Nile, and are succeeded near the sea by a range of primitive mountains which run down the whole way to Cosseir, at a distance of from about 20 to 30 miles from the coast, the intervening space being occupied in some places by low lime-stone and sand-stone hills. Jebel Ghrarib, about 28° 15′ N. lat., in the primitive range, is described as resembling in its lofty peaks the Aiguilles of Chamouny; its height is estimated at nearly 6000 feet above the sea. About 20 miles farther south, in a range of low hills, are copper mines, which appear to have been once extensively worked. At Jebel Dokhan, lat. 27° 26′ and about 25 miles from the sea, are the ruins of a town, and vast quarries of porphyry with antient roads crossing the mountains in all directions, and two wells cut through a solid porphyry rock. A small temple of red granite, with an inscription of the time of Hadrian, and dedicated to Serapis, has been left unfinished; all the materials are on the spot, but not a column was ever put up, and nothing was completed. A road led from Dokhan to Coptos, now Koft, on the Nile, about 100 miles to the south-west, and another road to the port of Myos Hormos, once a great mart on the Red Sea, but which was already deserted in the time of Pliny. There are some fine valleys in these mountains, but the sea coast is marshy and unwholesome. At Fateereh, about 40 miles south-east of Dokhan, in the old road to Cosseir, are ruins of a Roman station, with a temple of the time of Trajan, and quarries of granite. From Fateereh to Cosseir is three days' distance, according to the Arabs. South of Cosseir the mountains continue to run parallel to the coast as far as Jebel Zabarah or the mountain of emerald, which is about eight hours from the coast, and farther south-east to the ruins of Berenice, which are described by Belzoni. [BERENICE.] The coast of the Red Sea was surveyed in 1830-3 by Commander Moresby and Lieutenant Carless, E.I.C. service.

Antient History.—Egypt was one of the countries earliest civilized, and brought under a fixed, social, and political system. The first king mentioned as having reigned over that country is Menes or Men, who is supposed to have lived above 2000 years B.C., about the time fixed by biblical chronologists for the foundation of the kingdom of Assyria by Nimrod, and corresponding also with the æra of the Chinese emperor Yao, with whom the historical period of China begins. All inquiries concerning the history of nations previous to this epoch are mere speculations unsupported by evidence. The records of the Egyptian priests, as handed down to us by Herodotus, Manetho, Eratosthenes, and others, place the æra of Menes several thousand years farther back, reckoning a great number of kings and dynasties after him, with remarks on the gigantic stature of some of the kings and of their wonderful exploits, and other characteristics of mystical and confused tradition. (See Eusebius, *Chronicorum Canonum libri duo*, edited by A. Mai and Zohrab, Milan, 1818.) It has been conjectured that several of Manetho's dynasties were not successive, but contemporaneous, reigning over various parts of the country. From the time of Menes, however, something like a chronological series has been made out by Champollion, Wilkinson, and other Egyptian archæologists, partly from the list of Manetho and partly from the Phonetic inscriptions on the monuments of the country. (Wilkinson's *Chronology of the Kings of Egypt*, at the end of his *Topography of Thebes.*) The immediate successors of Menes are unknown till we come to Suphis and his brother or brothers, to whom the great pyramid is attributed by some, and who are supposed to be the same as the Cheops and Cephren of Herodotus, although that historian has placed them much later, after Sesostris and Mœris. Abraham was in Egypt about 1920 B.C., and we have the testimony of the Scripture as to the high and flourishing state of that country at that early period. The Scripture calls the kings of Egypt indiscriminately Pharaohs, which is now ascertained to be not the proper name of the individual monarchs, but a prefix like that of Cæsar and Augustus given to the Roman emperors. The word Phra in the Egyptian language meant the sun. Little or nothing is known of several successive dynasties except the names of some of the kings, until we come to Osirtesen I. of the sixteenth dynasty, who began to reign about 1740 B.C. Very few monuments remain of a date prior to his reign. The obelisk of Heliopolis bears the name of Osirtesen. The sixteenth dynasty, which reigned from 1812 to 1650 B.C., was from Lower Egypt, where the kings of this dynasty resided. Memphis however is said to have been built long before this, by King Menes, who diverted the course of the Nile in that neighbourhood, which before ran close to the western ridge, and made it run into a new channel in the middle of the valley. Under the sixteenth dynasty, about 1706 B.C., Joseph, and afterwards Jacob and his family, came to Egypt, where their descendants settled and multiplied in Lower Egypt. Egypt was then the granary of the neighbouring nations, and apparently the centre of a great caravan trade carried on by the Arabs or Ishmaelites, who brought to it the spices and other valuable products of the east. (*Genesis* xxxvii. 25.) Joseph died very old, under the seventeenth dynasty, which was also from Lower Egypt, and which reigned from 1650 to 1575 B.C. About this last period 'there arose a new king who knew not Joseph.' (*Exodus* i. 8.) This was the head of the eighteenth dynasty, from Diospolis, or Thebes, which dynasty reigned 340 years, according to Eusebius and other chroniclers, and which contains the names of the most illustrious sovereigns of antient Egypt. It appears probable that this dynasty was the continuation of the line of the old Diospolitan kings, who are mentioned as having reigned before Osirtesen I., which line may have been dispossessed by some revolution of the throne, or at least of the greater part of the country, which was occupied by a new race from Lower Egypt during the 16th and 17th dynasties. The irruption of the Hyksos, or shepherds, is supposed by some to have occurred during this period. Manetho's seventeenth dynasty consists of shepherd kings, who are said to have reigned at Memphis. These shepherds, who are represented as people with red hair and blue eyes, came from the north-east, perhaps from the mountains of Assyria; they conquered or overran the whole country, committing the greatest ravages, and at last settled in Lower Egypt, where they had kings of their own race. They were finally expelled by Tuthmosis or Thothmes I. of the 18th dynasty, after remaining in the country for more than 100 years. Some have conjectured that the hard task-masters of the Israelites were these same shepherd kings, but all this is involved in great doubt. One thing seems ascertained, namely, that the shepherds destroyed most of the monuments of Egypt raised by the former dynasties; and a remarkable fact is quoted in corroboration of this, that at Karnak and other of the oldest monuments of Thebes, raised under the 18th dynasty, sculptures and painted stones of good workmanship are found used as mere materials in the body of the walls. (Champollion, *Lettres au Duc de Blacas.*) The Exodus of the Israelites, 1491 B.C., falls, according to Wilkinson, under the reign of Thothmes III., 430 years after the visit of Abraham to Egypt. The Scripture says that Pharaoh perished in the pursuit of the Israelites, and it is remarkable that Amunoph II., the son and successor of Thothmes III., is represented in a drawing at Thebes as having come to the throne very young and under the tutelage of his mother. (Wilkinson's *Chronology.*) Under Amunoph III., who reigned about 1430 B.C., the emigration of Danaus to Argos is conjectured to have taken place. Osirei I., according to the Phonetic hieroglyphics, appears to have reigned about 1385, and his reign would fall nearly about the time of the Mœris of Herodotus, who lived about 900 years before that historian's visit to Egypt. The name of Mœris however is not found in the Phonetic inscriptions. Remeses II., or the Great, son of Osirei I., ascended the throne about 1350 B.C. and reigned above 40 years. This is supposed to be the Sesostris or Sesoosis of the Greek historians. Manetho places Sesostris much earlier, in the 12th dynasty, but it is thought probable by some that his Sesostris was a mythical personage, one of the early reported Egyptian conquerors, and that the name of Sesostris was afterwards given as a title of honour to other illustrious monarchs. At all events we now know from the monuments of Thebes that Remeses II. was one of the most warlike monarchs of antient Egypt; that his wars extended far, and against many nations. Some of these are represented as of much lighter complexion than the Egyptians, with flowing beards, and dresses evidently Asiatic. It is probable that his campaigns extended to Asia, perhaps against the kings of Assyria. That the old kings of Egypt extended their dominions to the east and north-east, as was done by their Greek and Mohammedan successors, is not only very likely, but it is attested as a fact by the Scripture, 2 *Kings* xxiv. 7, where, at a later period, when the power of Egypt had begun to decline, we are told that the king of that country 'came not again any more out of his land; for the king of Babylon (Nebuchadnezzar) had taken from the river of Egypt unto the river Euphrates all that pertained to the king of Egypt,' which seems to prove that the dominion of Egypt had extended at one time as far as the Euphrates. It has also been remarked that the figures of the prisoners made by Tirhakah, who fought against Sennacherib, previous to Nebuchadnezzar's time (2 *Kings* xix. 9), are represented in the Egyptian monuments as similar to those captured by the earlier kings of the 18th dynasty.

Remeses II. was succeeded by his son Amenophis, according to Manetho (Phtahmen Thmeioftep, according to the Phonetic signs), who seems to be the same as the Pheron (Pharaoh?) of Herodotus and the Sesoosis II. of Diodorus, who, according to both the latter historians, was struck blind, but recovered his sight. With him ended the 18th dynasty. The 19th dynasty, also of Diospolitans, began about 1270 B.C., and reigned till 1170. During this period the war of Troy took place, in the reign of a Remeses, supposed to be the fifth of that name, according to Pliny. Herodotus and Diodorus give King Proteus as contemporary with the war of Troy. Of the 20th and 21st dynasties nothing is known beyond the mere names of some of the kings, according to the Phonetic signs. The Pharaoh whose daughter Solomon married, 1013 B.C., must have been one of the 21st dynasty. It is curious that, from the Exodus till Solomon's time, a period of nearly five centuries, no mention is made in the Scriptures of Egypt, which proves that the storm of war, if such there was, passed off either to the eastward of Palestine, or that the Egyptian conquerors followed the maritime road by Gaza and the Phœnician coast, leaving the high land of Judæa to their right. (Wilkinson, *Materia Hieroglyphica*, Part ii.) The 22d dynasty, beginning with Sesonchis, according to Manetho, and Sheshonk, according to the Phonetic signs, who began to reign about 978 B.C., and who is the Shishak of the Scripture, at whose court Jeroboam took refuge and married his daughter, and who, after Solomon's death, plundered the temple of Jerusalem in the 5th year of Rehoboam (2 *Chronicles*, xii.). Shishak is represented as coming to the attack 'with 1200 chariots and 60,000 horsemen, and an immense multitude of Lubims (probably Libyans), of Sukkiims, and Ethiopians.' Of Osorkon I., the successor of Sheshonk, we have a date at Thebes commemorating the 11th year of his reign. Zerah, the Ethiopian king or chief, who attacked Asa, king of Judah (2 *Chron.* xiv.), was Osorkon's contemporary.

The 23rd dynasty, called Diospolitan, like the preceding, began about 908 B.C. with Osorkon II. Homer is believed to have flourished about his time, and he speaks of Egypt under its Greek name. The 24th dynasty, which is called Saite, from Sais, a district of Lower Egypt, begins with the Bocchoris of Manetho, the Bakhor or Pehor of the Phonetic signs, about 812 B.C. Diodorus places a long period between his reign and that of Sabacos, the Ethiopian, who however follows Bocchoris next but one in the Phonetic chronology and in that of Manetho. Sabacos (Sabakoph, Phonetic) begins the 25th dynasty of Ethiopians, who, about this time, invaded Egypt, or at least Upper Egypt. Tehrak or Tirhakah, one of his successors, attacked Sennacherib, 710 B.C. Sethos, a priest of Hephæsus, the great temple of Memphis, became king, and ruled at Memphis, contemporary with Tirhakah. After Sethos' death a great confusion or anarchy took place. At last twelve chiefs or monarchs assembled at Memphis, and took the direction of affairs, which they retained for 15 years. After this Psamatik I., or Psammitichus, the son of Nechao or Necos, who had been put to death by Sabacos, became, by the aid of Greek mercenaries, king of all Egypt, about 650 B.C. His son Necos II., the Pharaoh Nechoh of the Scripture (2 *Kings* xxiii.) marched against the king of Assyria to the river Euphrates: he defeated and slew Josiah, king of Judah, 610 B.C. He also began the canal that joined the east branch of the Nile with the Red Sea. His successor, Psamatik II., was followed by Psamatik III., supposed by some to be the Apries of Manetho, and the Pharaoh of Hophra of the Scripture, who defeated the Phœnicians, took Sidon, and invaded Cyprus, which was finally subjected by Amasis, who succeeded him on the throne. The reign of Amasis lasted forty-four years, according to a date on the monuments: his successor, Psammenitus, reigned only six months, when Egypt was invaded by Cambyses, 525 B.C., who overran and ravaged the country, and lost the greater part of his army in the neighbouring deserts.

The 27th dynasty includes the Persian Kings from Cambyses to Darius Nothus, during which time Egypt was a province, though a very unruly one, of the Persian monarchy. It was during this period that Herodotus visited Egypt. Though he saw that country in a state of humiliation and depression, yet he was powerfully struck by its buildings, and its highly advanced social state, as well as by the peculiarities of its manners and institutions. Egypt appears to have made upon Herodotus an impression something like that produced by England upon French or other continental travellers in the last century, as being a country unlike any other. But Herodotus derived his information concerning Egyptian history chiefly from the priests of Memphis, and consequently his account is very meagre in all that relates to Thebes and Heliopolis, the two other great centres of Egyptian hierarchy.

After several revolts the Egyptians succeeded in placing Amyrtæus, or Aomahorte, a Saite, on the throne, about 414 B.C. This king alone constitutes the 28th dynasty. He was succeeded by the 29th dynasty, of Mendesians, who defended Egypt against the repeated attacks of the Persians, with the assistance of Greek auxiliaries under Agesilaus and others. At last Nectanebos, being defeated by Ochus, fled into Ethiopia, 340 B.C., and Egypt fell again under the yoke of the Persians. The Persians were succeeded by the Macedonians, who, after the death of Alexander, founded the dynasty of the Ptolemies, or Lagidæ, who ruled over Egypt for nearly 300 years, and restored that country to a considerable degree of prosperity. [PTOLEMY.] At the death of Cleopatra, 30 B.C., Egypt was reduced to a Roman province by Augustus.

Having now closed this brief summary of the history of antient Egypt, imperfect and conjectural in part as it unavoidably is, we shall, in a few words, advert to the social condition of the country under its native kings. That condition is now tolerably well known by the attentive examination of its remaining monuments and their sculptures and paintings. The researches of the French in the expedition to Egypt, and of Belzoni, Champollion, Rosellini, and others, have put us in possession of a series of sketches evidently drawn from the life, and descriptive of the arts, industry, and habits of the antient Egyptians. To these works and the plates which accompany them we must refer the reader. There is no doubt that this singular nation had attained a high degree of refinement and luxury at a time when the whole western world was still involved in barbarism; when the history of Europe, including Greece, had not yet begun; and long before Carthage, Athens, and Rome were thought of. This high state of material civilization was attained under a system of institutions and policy which resembles in some respects those of the Hindoos. It was a monarchy based upon an all-powerful hierarchy. The inhabitants were divided into a kind of hereditary castes, the first of which consisted of the priests, who filled the chief offices of the state. They were the depositaries and the expounders of the law and the religion of the country. They monopolized the principal branches of learning: they were judges, physicians, architects. Their sacred books, like their temples, were not open to the vulgar.

They had a language or at least a writing peculiar to themselves. The king himself, if not of their caste, was adopted into it, was initiated into its mysteries, and became bound by its regulations. The priests were exempt from all duties, and a large portion of land was set apart for their maintenance; and we read in *Genesis*, that when Pharaoh in a season of famine bought, by the advice of Joseph, all the land of the Egyptians on condition of feeding them out of his stores, 'only the land of the priests bought he not, for the priests had a portion (of corn) assigned them of Pharaoh, and did eat their portion which Pharaoh gave them, wherefore they sold not their lands.' (xlvii. 22.) And again when Joseph, after the scarcity was over, made it a law of the land that the king should have for ever after a fifth part of the produce of the soil, restoring the rest to the owners, he excepted only 'the land of the priests,' which became not Pharaoh's.' (ib. 26.) The testimony of the Scripture is here perfectly in accordance with that of Herodotus and other historians. The priests were subject to certain strict regulations: they abstained from certain meats, and at times from wine, made their regular ablutions, had but one wife, while polygamy was allowed to the other castes, and they wore a peculiar dress according to their rank.

The soldiers formed the second caste, for Egypt had a standing army from a very remote period, divided into regiments or battalions, each having its standard with a peculiar emblem raised on a pike and carried by an officer. Their arms were the bow, sword, battle-axe, shield, knife or dagger, spear, club, and sling. Their besieging engines were the battering-ram, the testudo, and the scaling ladder. They had a military music, consisting of a kind of drum, cymbals, pipe, trumpet, and other instruments. The military caste was held in high repute and enjoyed great privileges. Each soldier was allowed a certain measure of land, exempt from every charge, which he either cultivated himself when not on active service, or let to husbandmen or farmers. Those who did the duty of royal guards had besides an ample allowance of rations. They were inured to the fatigues of war by gymnastic exercises, such as wrestling, cudgelling, racing, sporting, and other games, of which the representations still exist on their monuments.

The husbandmen formed another class, which was next in rank, as agriculture was highly esteemed among the Egyptians. They made use of the plough and other implements. They had various breeds of large cattle, sheep, goats, pigs, and a quantity of poultry reared chiefly by artificial means, the eggs being hatched in ovens, as it is the practice of the country in this day. The peasants appear to have been divided into hundreds, each with a peculiar banner, which they followed when presenting themselves before the magistrate for the census, which was taken at stated periods, when they were obliged to give an account of their conduct; and if found delinquent, were punished with the stick.

The next class was that of the artificers and tradesmen, who lived in the towns. The progress made by the Egyptians in the mechanical arts is evident from their monuments, paintings, and sculptures; in which the various handicrafts are represented. The mines of gold, copper, iron, and lead, which are in the mountains between the Nile and the Red Sea, were worked at a very remote date under the early Pharaohs. There is a passage in the work of Agatharchides on the Red Sea which describes their manner of working the gold mines and smelting the metal, and the sufferings of the people who were compelled to do that labour. (*British Museum, Egyptian Antiquities*, vol. ii. ch. 9.) The Egyptians were acquainted also with the art of gilding. The art of fabricating glass was early known among them. Beads of glass, generally coloured blue, are found on many mummies, as well as other ornaments of a coarse kind of the same material. A kind of antient porcelain, sometimes covered with enamel and varnish is found in great quantities in Egypt. Their pottery was often of the most elegant forms. The taste displayed by the Egyptians in several of their articles of furniture is not surpassed by our most refined manufactures of modern times. In the great French work and in the recent one of Rosellini we have specimens of many articles of furniture, especially chairs and couches, which are singularly beautiful in their forms. Linen cloth, plain or embroidered, white or dyed, was an article of Egyptian manufacture highly in repute among foreign nations. (*Ezekiel* xxvii. 7.) The art of making leather was also known to them.

The last class or caste included pastors or herdsmen, poulterers, fishermen, and servants. The herdsmen and shepherds appear to have been held in peculiar contempt among them. Besides servants, they had a number of slaves, both black and white. Fish was an article of common food, except to the priests. Wine of native growth was used by the rich, and a kind of beer was the drink of the poor. An account of the different grains, plants, and trees, the produce of antient Egypt, and also of its native animals, is given in Wilkinson's *Topography of Thebes*, [illegible] v., *on the manners and customs of the antient Egyptians*. The above-mentioned five castes as specified by Diodorus i. 74, were subdivided into ranks according to the various callings and trades, and this has occasioned some variety in their enumeration. Herodotus reckons seven castes, Plato six, others have not reckoned the despised shepherds as a caste, and others have counted the military as one caste with the husbandmen, as being drafted from the body of the latter. Like the Hindoo, every Egyptian was required to follow his father's profession and to remain in his caste.

That such institutions were incompatible with our modern notions of independence and freedom is evident enough; but freedom is a word differently understood in different ages and countries, and the Egyptians, trained up as they were from infancy to reverence laws which they deemed immutable, might have enjoyed as great a degree of happiness as most nations in the old world. But the degradation of the lowest caste, and the waste of human strength and human life in the working of their mines and the building of their pyramids and other colossal structures, and the frequency and nature of the summary punishments inflicted, as mentioned by Diodorus and confirmed by their monuments, seem to imply that the mass of the people, and the lower classes especially, found their superiors of the sacerdotal caste to be hard task-masters.

The progress of the Egyptians in the exact sciences has been taken for granted without sufficient evidence. Of their astronomy we know but little, but it appears to have been confounded with mythology and astrology, and made subservient to religious polity. [DENDERAH, ZODIAC OF.] Their year was of 365 days: for their method of correcting it see SOTHIAC PERIOD. Diodorus says that they foretold comets; but he also says that they foretold future events, leaving us in doubt whether they were successful in either or both cases. We cannot here enter into the vast and intricate ground of Egyptian mythology, and must refer the reader to the special works on that subject by Champollion, Wilkinson, and others. Their mythology appears to have been originally symbolical, but afterwards degenerated, at least for the vulgar, into gross idolatry. That they had some practical knowledge of geometry, which indeed must have been requisite for the construction of their buildings, &c. is generally admitted. Yet they appear not to have known until a comparatively later period that the level of the Red Sea was much higher than that of the Mediterranean and of the Nile. Their boats were rude and clumsy, and only constructed for river navigation. They were for a long time averse to maritime expeditions from superstitious prejudices, probably instilled by their priests in order to keep them secluded from the rest of the world, and the Phœnicians were then the sea-carriers of Egypt. It was chiefly after the restoration effected by Psamaticus I., and their subsequent intercourse with the Greeks, that their rigidity in this and other respects relaxed: they had their ships of war both on the Mediterranean and Red Sea, and under Apries Egypt had sufficient naval power and skill to cope with the fleets of Tyre. His predecessor Necos II. is said by Herodotus to have dispatched some Phœnician vessels by the Red Sea to circumnavigate Libya (Africa), and to return to Egypt by the Pillars of Hercules, which they effected. The truth, or at least the extent of this expedition has been much questioned. [AFRICA.] There is a curious story in Plato's 'Critias,' of Sonchis, an Egyptian priest, having told Solon of the Atlantic isles, which he said were larger than Asia and Africa united, which seems to imply something like a knowledge of the existence of the Western Continent.

The money of the Egyptians was in rings of silver and gold, similar to those still used in Sennaar, and its value was ascertained by weight, and its purity by fire. Gold was brought to Egypt from different tributary countries of Ethiopia and Asia, besides what they drew from their own mines. The revenue of Egypt, derived from the taxes alone, amounted, even during the negligent administration of Ptolemy Auletes, to 12,500 talents between the and four millions sterling. Diodorus reckoned its population at seven millions, and Josephus at seven millions and a half, exclusive of that of Alexandria, which exceeded 300,000. For further particulars on the commerce, resources and policy of antient Egypt, see Heeren's *Researches*. Champollion le Jeune in his 'Egypte sous les Pharaons,' has endeavoured to retrace the national names and localities of the antient Egyptian towns, many of which had disappeared long before Strabo's time, or their names had been disfigured by the Greek writers. Egypt was, according to Champollion, divided already under the Pharaohs into 36 nomes or governments, 10 in the Thebais or Upper Egypt, 16 in Middle Egypt, and 10 in Lower Egypt, commonly called the Delta. Each nome was subdivided into districts or toparchies. This was exclusive of the Oases, the dependencies on the side of Nubia, &c.

With regard to the principal existing monuments of antient Egypt we refer the reader to the respective heads, such as DENDERAH, EDFU, PYRAMIDS, THEBES, &c., and for the general character of Egyptian architecture to the following article.

Modern History. Passing over the ages during which Egypt was a province of the Roman Empire (see Hamilton's *Ægyptiaca*, on the State of Egypt under the Romans, and *map of Egypt* with the names of the Roman period, by Raoul Rochette), we begin the modern history of Egypt at the Mohammedan conquest. Under the Caliphate of Omar, successor of Abu Bekr, Amer Ebn el As invaded Egypt, A.D. 638, and took Pelusium and Babylon of Egypt, a strong Roman station, which sustained seven months' siege. John Mecaukes, governor of Memphis for the Byzantine emperor, treacherously surrendered his trust, and the Copts agreed to pay tribute or a capitation tax to the Caliph, with the exception of old men, women, and monks. The hatred, not only political but religious, which the Copts bore to the Greeks, facilitated the success of the Moslems. The first mosque on Egyptian ground rose with the new town of Fostat on the site of Roman Babylon. Alexandria made a long and obstinate defence; it fell at last, and was plundered. The Saracen General asked the Caliph what was to be done with the library, and Omar ordered it to be burnt. But the libraries of the Ptolemies had perished before—the Bruchion was destroyed during the siege of Julius Cæsar, and that of the Serapion was dispersed by Theophilus the Patriarch, A.D. 390; the library destroyed by Omar's order was therefore a more recent collection. [ALEXANDRIAN LIBRARY.] The whole of Egypt as far as Syene was soon reduced to a province of the Caliphate, the capital of which was Fostat. In A.D. 868, Ahmed ebn e' Tooloon, governor of Egypt for the Abbaside Caliphs, usurped the sovereignty of the country and founded the dynasty of the Tooloonides, which lasted till 906, when the Caliphs retook Egypt. But in 912 Abayd Allah el Mahdee after usurping the government of Eastern Africa, invaded Egypt, which he retained till 934, when he was defeated by the forces of the Caliph. In 936 El Akhshed Mohammed ebn Tughg, a Turkish chief in the service of the Caliph, usurped the government of Egypt, and began a new dynasty which lasted till 970, when the Fatmieh or Fatemides, the successors of Mahdee, who had continued to rule in Africa, took possession of Egypt. El Moez, who styled himself Caliph, built Misr el Kahirah, where he fixed his residence, leaving Yousef Ebn Zeiri his viceroy in Africa. From that time till 1171, the Fatemite Caliphs reigned over Egypt, independent of and rivals to the Abbaside Caliphs of Bagdad. This was the period of the wars of the early Crusades, in which the Fatemides acted a conspicuous part. Egypt retained much of its importance and splendour under their dynasty. (See *Etat Arabe de l'Egypte*, by Sylvester de Sacy, joined to his translation of Abdallatif.) The Kurd Salah e' deen Yoosef Ebn Eyoob succeeded to the Fatemides in 1171, and founded the dynasty of the Eyoobites, which lasted till 1250, when El Moez, a Turkoman memlook or slave, after murdering Touran Shah, usurped the throne, and founded the dynasty of the Baharite Sultans, who took possession of Syria also. Baybers, a memlook also, assassinated his master in 1261 or 62, made himself Sultan of Egypt, retook Syria from the Tatars, took Damascus, and put an end to the Caliphate of Asia, and extended his conquests as far as and over part of Armenia. His descendants reigned till 1382, maintained possession of Syria as far as the Euphrates, and encouraged agriculture and the arts. Their dynasty is known by the name of Baharite Memlook Meleks or Sultans. They did not assume the title of Caliphs, but allowed the descendants of the Abbasides to retain that name, and to live in Egypt under their subjection, as a sort of state prisoners.

In 1382 Dowlet el Memeleek el Borgéëh, a Circassian slave, took possession of the throne and founded the dynasty of the Borgéëh, or Circassian Memlooks, which lasted till 1517, when Selim I., the Ottoman sultan, advanced into Egypt, defeated the Memlooks at the battle of Heliopolis, and caused Toman Bey, the last of their kings, to be hanged at Cairo. Selim abolished the dynasty, but not the aristocracy of the Memlooks; he even made conditions with the Memlooks by a regular treaty, in which he acknowledged Egypt as a republic, governed by twenty-four beys tributary to him and his successors, who appointed a pacha, or governor, to reside at Cairo. This pacha, however, was to make no alterations in the system of government without the consent of the beys, who might even suspend him from his functions if he acted arbitrarily, until the pleasure of the Porte should be known. The beys were to elect from among themselves a sheik of Belad to be their head, who was looked upon by the Porte as the chief of the republic. In time of war the republic was to send 12,000 men to join the Ottoman armies. In other respects the republic, that is to say, the Memlook aristocracy, was to enjoy absolute power over the inhabitants of Egypt, levy taxes, keep a military force, raise money, and exercise all the rights of sovereignty. This treaty was signed in the year 887 of the Hegira, A.D. 1517. (Savary, *Lettres sur l'Egypte*, vol. ii.) Under this form of government Egypt remained nominally subject to the Porte, against whose authority the Memlooks often openly revolted, till the French invasion of 1798, when Bonaparte, under the pretence of delivering Egypt from the yoke of the Memlooks, took possession of the country. The English sent an expedition in 1801 to aid the Porte, which drove away the French, and restored the pacha appointed by the sultan. The Memlooks and the pacha, however, could not agree; scenes of bloodshed and treachery took place, and at last the present pacha, Mehemet, or rather Mohhammed Ali, contrived to collect most of the beys with their principal officers within the citadel of Cairo, under pretence of an entertainment, where he had them all massacred in March, 1811. A few escaped into Upper Egypt, from whence they were driven into Nubia, and being also driven from thence in 1821, the few who survived took refuge in Dar-fur. [DONGOLA.] Thus ended the Memlook power, which had ruled over Egypt for more than four centuries. Savary gives an account of the institutions of that singular body, which were still in full force in his time. Their destruction, although perfidiously contrived, has been undoubtedly a benefit to Egypt, for their government was as tyrannical and oppressive as their moral character was depraved. It was a government of slaves who had become masters, for the body of Memlooks was perpetually recruited from young slaves brought chiefly from Georgia and Circassia. Every bey was a tyrant in his own district. There was not even union among them, as they were frequently at war with each other. Personal bravery or animal courage was their only virtue, if it deserves that name. Egypt suffered more under the Memlooks than during any other period of its history.

Present State of Egypt.—This country is commonly divided by geographers into three regions, namely, Bahari, or Maritime, or Lower Egypt; Vostani, or Middle Egypt; and Said, or Upper Egypt. But the administrative division of the country is by provinces, or prefectships, of which there are fifteen in Lower Egypt, and ten in Middle and Upper Egypt together. The provinces are—1. Masr, or Cairo, with the town of that name, the capital of the whole country, and the town of Boolak, the port of Cairo on the Nile, Old Cairo, or Fostat, and Suez, on the Red Sea; 2. Kelioub, north of Cairo, with the towns of Kelioub, Matareyeh, near the ruins of Heliopolis; Artrib, Choubra, where the pacha has a fine country residence, and Abouzabel, where is the new College of medicine and surgery, with 300 pupils, and a large hospital attached to it; 3. Belbeys, east of Kelioub, on the borders of the Desert; 4. Chibeh, north of Belbeys, with the towns or villages of Chibeh, and Tell Bastah, and Heydeh; 5. Mit Ghamer, north of Kelioub and near the Damietta branch of the Nile; 6. Mansourah, north of Mit Ghamer, likewise on the east bank of the Damietta branch, with the town of Mansourah, and the village of Tmay el Emdid, which has a monolith of granite; 7. Damietta, with the towns of Damietta and

Menzaleh, and the forts of El Arish and Tyneh. on the borders of the Syrian Desert; 8. Mehallet el Kebir, with the town of that name, within the actual Delta, on the left bank of the Damietta branch, and the small towns of Semennout and Abousir; 9. Tantah, south of Mehallet, with the town of Tantah, situated near the middle of the Delta, one of the principal towns of Lower Egypt, remarkable for its fine mosque, and the fair which takes place three times a-year, and is much frequented by pilgrims who come to visit the tomb of Seyd Ahmed el Bedaouy, a celebrated Mohammedan saint; 10. Melig, south of Tantah with the towns of Melig and Chibn el Koum; 11. Menouf, south of Melig, and within the angle formed by the bifurcation of the Nile; 12. Negileh, with the town of that name, on the left or west bank of the Rosetta branch, and the towns of Terraneh and Wardan; 13. Fouah, north-west of Mehallet, with the town of Rashid, or Rosetta, and the towns of Fouah and Deiroot; 14. Damanhour, on the left bank of the Rosetta branch, north of Negileh, with the towns of Damanhour and Rahmanyeh; 15. Alexandria, with the city of that name.

On entering the valley of the Nile from the Delta side we find, 1. Jizeh, on the left or west bank of the river, opposite Cairo, a small town, head of the prefectship of that name, near the great pyramids, and not far from the ruins of Memphis, upon which are built three modern villages, Bedreshin, Mit Rahyneh, and Memf; 2. Benisouef, south of Jizeh, on the same side of the Nile, a considerable and industrious town, in one of the most fertile districts of the valley of the Nile, with the towns of Abou Girgeh and Samallout further south; 3. On the opposite or east bank of the Nile is Atfyh, a town and prefectship; 4. West of Benisouef is the district of Faïoum, with the town of Medinet el Faïoum; 5. South of Benisouef, but extending on both banks of the Nile, is the district of Minyeh, with the towns of Minyeh, Melaoui, and Eshmounein on the left, and those of Sheyk Abadeh and El Bershel on the right bank; 6. Manfalout, south of Minyeh, with the town of that name on the left bank, and several villages on both banks of the Nile; 7. Siout, with the town of that name, the capital of Upper Egypt, and the residence of a governor. It is situated on the left bank, is a great slave-market, and the entrepôt of the caravan trade with Darf-fur and Sennaar, with a spacious bazaar, and 12,000 inhabitants—Richardson says 20,000; 8. Girgeh, south of Siout, with the towns of Girgeh, 7000 inhabitants, on the left, and Ekhmym, 10,000, on the right bank of the Nile; 9. Kenéh, with the town of that name, on the right bank, which has 5000 inhabitants, and carries on a considerable intercourse with Cosseir and the opposite coast of Arabia, and is known for its manufactory of porous earthen vessels used for keeping water cool. Kous, near the ruins of Coptos, Denderah, on the left bank, and the ruins of Thebes and of Abydus are in the prefectship of Kenéh; 10. Esneh, the most southern province of Egypt, with the town of that name, on the left bank, with about 4000 inhabitants, manufactories of cottons and shawls, and pottery; it is a great market for camels, and the emporium of the Abyssinian trade. The other towns are Edfu, Assouan or Syene, Koum Ombou, with a fine temple, and Selseleh, with its quarries.

For the principal towns of Egypt see the respective heads ALEXANDRIA, CAIRO, DAMIETTA, ROSETTA, &c. The population of the smaller towns is very difficult to be ascertained, as there is no census or register kept.

The whole of the cultivable land of Egypt, in the valley of the Nile and the Delta, is reckoned at 17,000 square miles. The resident population has been generally stated at two millions and a half, but a recent traveller thinks it does not exceed two millions at the utmost, of whom 1,750,000 are Mohammedan Egyptians, including the fellahs or peasants and the townspeople; 150,000 are Copts or Christian Egyptians; 10,000 are Osmanlees or Turks and Albanians, as yet the ruling race; 5000 Syrians, 5000 Greeks, 5000 Jews, and 2000 Armenians, and about 70,000 are black slaves, Nubians, Moghrebins, &c. (Lane's *Modern Egyptians*.) In this calculation the nomadic Arabs of the neighbouring deserts, whose number cannot be ascertained, are not included. The language of the natives is Arabic; but Turkish is still the language of the government. For the Copts and Coptic language see those articles. The great bulk of the Mohammedan natives is of Arab stock, but many Copts or aborigines have at different times embraced Mohammedanism, and numerous intermarriages have taken place between the Arab settlers and the Copts, Nubians, &c. The fellahs of Egypt have lost much of their original Arabian character; they are become proverbially tame and servile, and are despised by the neighbouring Beduins, who never give them their daughters in marriage. The townspeople may be considered as having attained as high a degree of civilization as any in the East: and 'Cairo,' says Mr. Lane, 'must be regarded as the first Arab city of our age. There is no other place in which we can obtain so complete a knowledge of the most civilized class of the Arabs.' The men are generally well proportioned and muscular, their height about five feet eight or five feet nine; the women beautifully formed, and not too fat. Their complexion in Cairo and the northern provinces is clear, though yellowish, and their skin soft; the lower classes are darker and coarser. The people of middle Egypt are of a more tawny colour, and those of the southern provinces are of a deep bronze complexion. Their countenance in general is of a fine oval form; the nose is straight, though rather thick, the lips rather full, the eyes black and brilliant, the beard commonly black and curly, but scanty. For the dress and habits of the various orders see Lane's *Modern Egyptians*, vol. i.

The climate of Egypt, during the greater part of the year, is salubrious. The khamseen, or hot south wind, which blows in April and May, is oppressive and unhealthy. The exhalations from the soil after the inundation render the latter part of the autumn less healthy than the summer and winter, and cause ophthalmia and dysentery, and other diseases. The summer heat is seldom very oppressive, being accompanied by a refreshing northerly breeze, and the air being extremely dry. This dryness however causes an excessive quantity of dust, which is very annoying. The thermometer in Lower Egypt in the depth of winter is from 50° to 60° in the afternoon and in the shade; in the hottest season it is from 90° to 100°, and about ten degrees higher in the southern parts of Upper Egypt. The climate of Upper Egypt, though hotter, is more healthy than that of the lower country. The plague seldom ascends far above Cairo. Ophthalmia is also more common in Lower Egypt: it generally arises from checked perspiration, but is aggravated by the dust and other causes, and by the neglect and filth of the natives, so that great numbers of Egyptians are blind in one or both eyes. The houses of the wealthier classes in the principal towns are substantially built, roomy, and commodious, but the dwellings of the lower orders, especially of the peasants, are of a very mean description, being mostly built of unbaked bricks, cemented with mud. Many of them are mere hovels. Most of the villages of Egypt are situated upon eminences of rubbish, the materials of former buildings, and thus rise a few feet above the reach of the inundation: they are surrounded by palm trees.

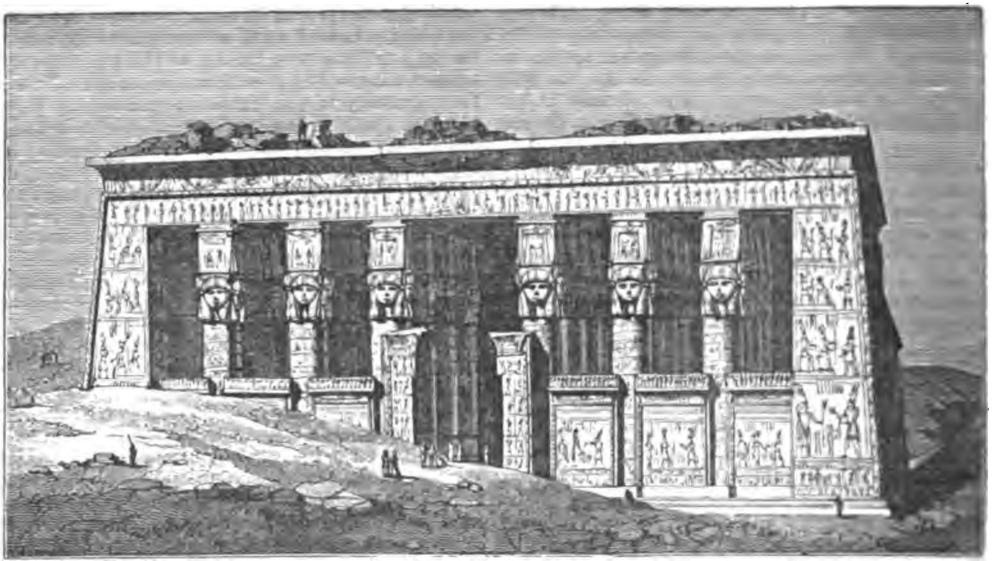
The agricultural produce of Egypt consists of the following winter plants, which are sown after the inundation and reaped in about three or four months after: wheat, barley, beans, peas, lentils, vetches, lupins, clover, flax, colewort, lettuce, hemp, cummin, coriander, poppy, tobacco, water-melons, and cucumbers; and of the following summer plants, which are raised by artificial irrigation by means of water-wheels and other machinery: doorah, Indian corn, onions, millet, henneh, sugar-cane, cotton, coffee, indigo, madder. Rice is sown in the spring and gathered in October, chiefly near Lake Menzaleh. Of the fruit trees, which grow mostly in gardens near the principal towns, the mulberry and Seville orange ripens in January, apricots in May, peaches and plums in June, apples, pears, and caroubs at the end of June, grapes at the beginning of July, figs in July, prickly pears end of July, pomegranates and lemons in August, dates in August, citrus medica in September, oranges in October, sweet lemons and banana in November. The poor fellah or farmer who cultivates the soil derives but little benefit from the prodigality of nature; he is compelled to pay a heavy land-tax, another tax to government for the use of the water-wheels, besides additional taxes and exactions of the local sheikh, the Copt scribe, and the Turkish officer, and then he is obliged to sell a portion or the whole of the produce of his land to the government at a fixed price, and to carry it to the granary at his own expense. The fellah, to supply the bare necessaries of life, is often obliged to steal and convey secretly to his hut as much as he can of the produce of his own labour. He may either himself supply the seed for his land, or obtain it as a loan from the government; but in the latter case he receives hardly three-fourths of what he pays for, the remainder being stolen by the subordinate officers. The pacha has dispossessed all the private proprietors throughout his dominions, giving to each, as a partial compensation, a pension for life, so that the farmers are now his own tenants and entirely at his mercy. (Lane, vol. i., c. 4, and Wilkinson's *Thebes*, pp. 268 and foll.)

The government of Mohammed Ali, too extravagantly praised by some, is certainly much more rational, orderly, and humane, than that of the memlooks or that of the old pachas in the other dominions of the Porte. He administers impartial justice to all his subjects, without regard to race or religion; has established regular judicial courts and a good police; has done away with tortures and other barbarous punishments; has encouraged instruction to a certain extent; has removed most of the ignorant prejudices which existed among his subjects against the arts and learning of Europe; and has introduced European manufactures and machinery; he keeps a printing-office and a journal; has formed schools and colleges for the arts and sciences and for military and naval tactics. All this is much more than it may seem at first sight to a person unacquainted with the state of Egypt and other Turkish provinces forty years ago. But the pacha's ambition and the difficulties of his situation have obliged him to resort to two violent expedients, an enormous taxation and an oppressive conscription. The pretended legislative assembly sitting at Cairo is a mere fiction of enthusiastic panegyrists. The government of Egypt is still absolute in the strictest sense of the word, though the present pacha has chosen to govern according to forms and regulations which he has himself established. He has formed a council consisting of his chief officers and of the provincial and local governors and sheikhs, whom he occasionally consults. Many of the subordinate agents of the government in the provinces still exercise occasional acts of capricious tyranny, which seldom reach their master's ears, but whenever they do he is not slow in punishing the offenders and redressing the grievances of the oppressed. Of what Mohammed Ali has really done a good sketch may be found in Planat, *Histoire de la Régénération de l'Egypte*, 8vo., Paris, 1830, and in a notice of the same work in No. xiv. of the *Foreign Quarterly Review*, April, 1831. The reforms effected by Mohammed Ali are far more complete and effective than those of Sultan Mahmood in Turkey, and are directed by a keener sagacity and with a steadier purpose. Mengin, 'Histoire de l'Egypte sous le gouvernement de Mohammed Ali,' 2 vols. 8vo. with an atlas, Paris, 1823, gives a full account of the career of this extraordinary man. At the end of the atlas there is a 'Tableau du Commerce de l'Egypte avec l'Europe.' For the various arts and manufactures of Egypt see Lane's vol. ii. 1.

The present dominions of the ruler of Egypt extend on one side to Sennaar and Kordofan, and on the other over all Syria to Adana, a part of Cilicia at the foot of Mount Taurus. He is likewise possessed of the fine island of Candia. In Arabia he is protector of Mecca and Medina, and lord of the Hedjaz. He is possessed of at least as extensive a tract of country as any of his predecessors of the Fatimite, Ptolemaic, or Pharaoh dynasties. Whether this empire will survive his death is a very doubtful question. His power is founded on a strong military force, which consists of between fifty and sixty thousand regular troops, the officers of which are mostly proud Osmanlees, aliens to Egypt, and the soldiers are the sons of the poor, oppressed, despised fellahs. No Arab officer, says Planat, is raised above the rank of lieutenant. The Osmanlees fill likewise the principal offices of the government. But the native Egyptians are said to be quick at learning, hardy, frugal and persevering; they make excellent soldiers; they divest themselves of old prejudices more easily than the Turks, and in their intercourse with Europeans they exhibit none of the jealousy and pride of the latter. Whatever therefore may be the consequence of Mohammed Ali's reforms, with regard to the stability of his dynasty, there is some reason to hope that the impulse which he has given to the native population will not be lost, and that the seeds of improvement scattered about Egypt will spread in course of time to other parts of the Arab world, of which Egypt forms the central and so important a part.

EGYPTIAN ARCHITECTURE. This was not included under the head of Civil Architecture, for the reason that it is purely monumental or historical, and not at all the object of study to the architect except as belonging to the archæology of his art, and as matter of curiosity; so totally distinct is it in its taste from what is termed classical antiquity. Indeed, until of comparatively very late years, hardly any thing was known of the Egyptian style, or the edifices executed in it, with the exception of the pyramids; for previously to the French expedition to Egypt, at the close of the last century, no satisfactory delineations had been taken of the temples and their details; but merely such views as were calculated to convey some general idea of their enormous masses and colossal grandeur. Hence it has been—we may say even still continues to be—regarded as wonderful both for the gigantic vastness of its structures, and the prodigious solidity of the materials and mode of construction employed, but at the same time as utterly devoid of beauty in its forms and proportions,—uncouthly sublime. Yet as the first impression of strangeness wears off—when the eye, so long habituated to Grecian and modern architecture, becomes more accustomed to it, and the first prejudices against it are overcome, it will be found to possess much elegance in some of its forms, together with powerful and legitimate architectural effect.

In character, the Egyptian is the very reverse of the Gothic style; for although both are distinguished by grandeur and solemnity, the one aims at ponderous massiveness, and affects low proportions, and great extent of unbroken horizontal lines; while the other affects exactly the contrary—slenderness and loftiness, forms aspiring upwards, and extreme diversity of outlines. Notwithstanding, too, that Egyptian architecture has much in common with that of Greece, it exhibits, together with what stamps the affinity between them, many striking points of difference. While they agree in having columns supporting a horizontal epistylium, or entablature, and in the general proportions resulting from such a disposition, they disagree in almost all their other subordinate particulars. It will, therefore, not only be interesting in itself, but facilitate explanation, to compare the Egyptian style with the Greek, as described in the articles Civil Architecture and Column. Although, in the massiveness of its proportions, in simplicity and breadth of effect, its character partakes more of that of the earlier Doric—the latter being, in fact, the first remove from it,—there is one remarkably striking difference between them; for Egyptian columns are as frequently cylindrical as not; whereas those of the earlier Doric taper very suddenly, owing to the difference between their upper and lower diameter, and the shortness of their shafts. In Egyptian buildings, on the contrary, the profile of the columns is vertical, or nearly so, while that of the walls is sloped; thus producing the same degree of contrast between the two which is observable in the Greek Doric, although the mode adopted in the one case is just the reverse of that pursued in the other. It may further be remarked that in both styles the general outline was nearly the same, it being sloped in each; in the Egyptian, by the walls; in the Doric, by the external peristyle of columns enclosing them*; whereby, in the latter case, as well as in the former, the base is wider than a horizontal line on the level with the upper part of the columns. Or if we take the ground-line formed by the lowest of the steps on which the columns are placed, we find that it accords very nearly with that of the cornice, or uppermost line of the building, similarly as in Egyptian edifices. This will be tolerably well understood from the view, in the next page, of the front of the temple at Denderah, which exhibits the sloping or tapering profile we have been describing, and to which we shall have occasion again to refer in explanation of various other particulars. From what has been stated as to Egyptian columns being cylindrical, it is not to be understood that they were either invariably or perfectly so, but that such was their general form; because there is occasionally a slight difference between the upper and lower diameter; or else the shaft is cinctured at intervals by bands consisting of three or more rings encircling it, and thereby increasing the diameter in those parts. In addition to this species of ornament, the shaft was variously decorated in other respects, the spaces between the bands being sometimes sculptured with hieroglyphics; at others, reeded, that is, its surface was divided into a series of upright mouldings, or staves, so as to have the appearance of a bundle of smaller pillars bound together, of which mode, as well as that of encircling the shaft with ring mouldings, frequent examples occur in Gothic buildings. The kind of striating, or striping, just described, is the reverse of that practised in the Doric and other Grecian orders, since in the latter it was produced by concave channels, or flutings, but in this by convex surfaces. The diver



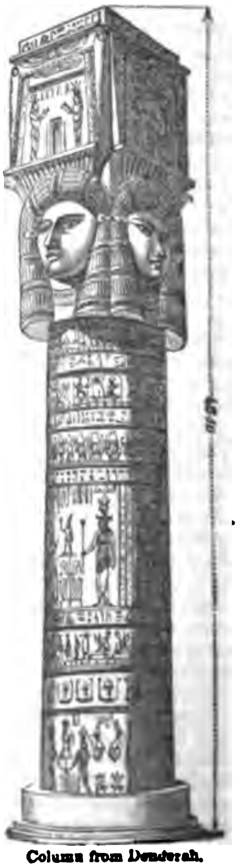
Front of the Temple at Denderah.

sity observable in Egyptian columns is so great that it is impossible to specify here all their varieties, which can be learned only by studying them in engravings; equally impossible is it, too, to reduce them to any kind of system, there being neither any peculiar form of capital, or other distinct characteristic, nor any thing in regard to proportions whereby they can be classified; for we find columns similar in proportions differing materially in all the rest, or else *vice-versâ*.

Egyptian columns have rarely any distinct base, seldom more than a circular plinth; but they have frequently an ornamental footing, which differs, however, from a base, in being contracted instead of expanded below. It may be described as shaped like the calyx of a flower, the resemblance to which is increased by its being sculptured into some forms of foliage, so that the shaft appears to be set in and rise out of a plant. Of this description are the bases of the columns of the temple at Latopolis or Esné. By some this has been insisted upon as a defect and as indicative of weakness; consequently, contrary to that law of architecture which prescribes that there should be apparent as well as real strength, more especially where the expression of solidity is naturally looked for. Still it may not unreasonably be urged that, as in all such cases, the judgment comes to the aid of and corrects the eye, what is known to be strong cannot fairly be said to appear weak; and the solidity of columns which have stood the test of some thousands of years cannot possibly be called in question. Were we unacquainted with its properties, even the form of the arch might be thought ill calculated for sustaining pressure; by others pendents likewise from vaulted roofs might be deemed blemishes rather than ornaments, as carrying with them a decided appearance of insecurity. The particular kind of Egyptian base here alluded to is certainly not in accordance with Grecian principles, yet it does not therefore exactly follow that it is faulty in itself. On the contrary, it may be argued that the excess of strength which they gave their structure, and the prodigious solidity and durability of the materials employed, allowed the architects of Egypt to contract the diameter of their columns below, without rendering them at all weak. Perhaps, too, one motive for doing so was thereby to produce a still more effective contrast between the columns and the general outline of the building, which, as already explained, sloped upwards.

The most usual form adopted for capitals was bell-shaped, that is, resembling a bell reversed, or rather the bell and petals of a flower, with a rim bending downwards, which was sometimes quite circular, thereby giving the whole somewhat the appearance of a mushroom; at others, jagged, the circumference being divided into a number of convex curves, forming so many distinct petals. The six specimens given in the article **Column**, vol. vii., page 383, exhibit two of the latter, and three of the first-mentioned variety of the bell-shaped capital.

From these it will be seen what variety prevailed in the decorative details, some being cut into distinct leaves, either convex or concave, others embellished with sculpture representing branches and flowers. It will also be perceived that in their general mass the capitals of this class, far from having anything in common with that of the Grecian Doric, bear some general similarity to that of the Corinthian order; at the same time both the foliage itself and its arrangement are altogether of a different character. Yet even were the resemblance more perfect in these respects, there would still exist an exceedingly wide distinction between them and every variety of either Grecian or Roman capitals, namely, in the abacus being a mere square plinth, considerably smaller than the capital itself. Consequently it bears no similitude whatever to that of the Doric, which overhangs the echinus, and extends beyond the architrave which rests upon it; while it is equally remote from that of the Corinthian, since, besides being enriched with mouldings, the latter has its sides curved so that the angles extend to those of the volutes. The Egyptian abacus, on the contrary, is anything but ornamental in itself, and would be a defect, were it not that in the buildings themselves it can

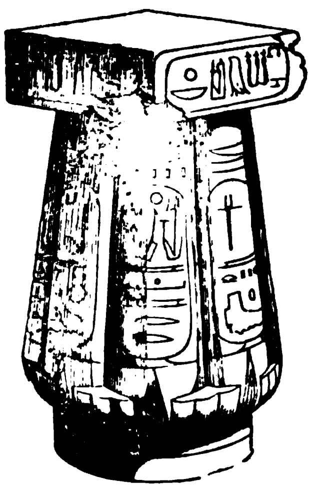


Column from Denderah.

hardly be seen, owing to its smallness, and the projection of the rim of the capital; consequently, unless it happens to be very deep, it serves chiefly to detach the capital from the architrave, and prevent that heaviness of appearance which would otherwise be occasioned. The first figure among the specimens above referred to shows an example of what may be termed the double capital, peculiar to Egyptian architecture, for above the usual shaped capital is a square member, sculptured on each of its sides with an Isis' head, and on this again is placed a small temple, so that instead of a double this may be termed a triple capital. The columns of the temple at Tentyra or Denderah offer another instance of the double capital in some respects similar to, in others greatly differing from the preceding.

Here the lower capital consists of four Isis' faces, disposed so as to form a square, larger than the shaft, the folds of the head-dress hanging down and projecting beyond it: above each face is a kind of fluted abacus; and above is a square temple. The shaft also varies considerably from those shown in the preceding examples; for instead of being striated vertically and banded horizontally, this is covered with hieroglyphics disposed in series of rings. Another remarkable circumstance is the great height of the whole capital, it being not less than two-fifths of the shaft.

There is another species of capital of very frequent occurrence, which is totally distinct from either of the above two classes; and although its form may, at first sight, be considered uncouth, it is well calculated for effect; neither is it devoid of simplicity. After sweeping out from the shaft, instead of continuing to expand as it proceeds upwards, it slopes back so as to diminish until it is contracted again to the diameter of the shaft itself. The decoration consists in its being subdivided into eight lesser shafts, inscribed with hieroglyphics, as are likewise the faces of the abacus, which member here becomes very pronounced, and occasions a picturesque play of light and shade. Capitals of this kind, as well as other varieties, occur at Luxor. In their proportions Egyptian columns vary no less than in other particulars, their height amounting in some instances to no more than three diameters, in others extending to eight or upwards. Yet such difference is not attended by any regularly corresponding one, either as regards the column itself, or the parts connected with it. Further, it is by no means unusual to meet with square pillars or *tetrapleurons*, with either a statue, or a caryatid figure standing before, but distinct from it.

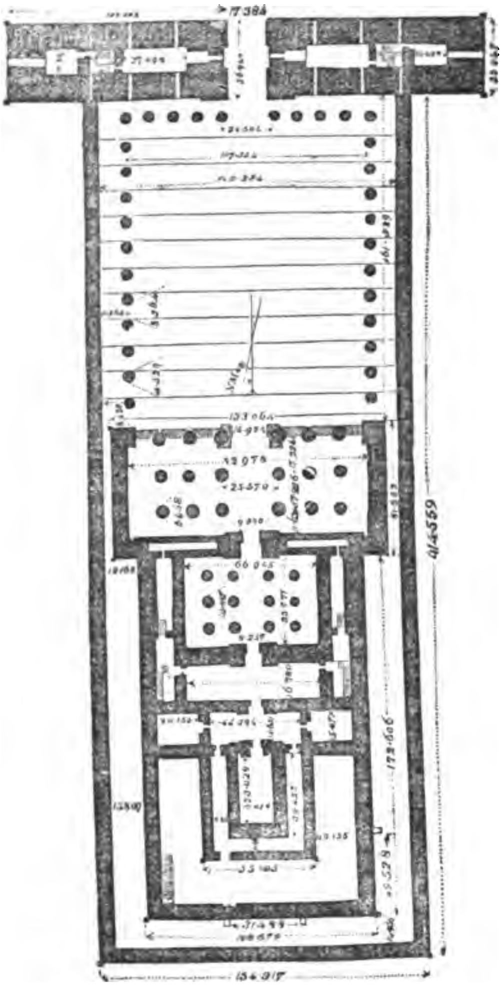


The Egyptian entablature is so far from displaying any thing like the same variety as the columns, that it is nearly uniformly the same in buildings which differ very much from each other in regard to their columns. Unlike that of the Greeks, it consists of only two divisions, the epistylium or architrave, and the cornice; the height of both being generally one-third of that of the columns. More frequently than not the epistylium was enriched with sculpture in hieroglyphics; which circumstance alone constitutes a great difference between the practice of the Egyptians and that of the Greeks. Another singularity is, that the epistylium was included within the convex moulding or *torus* carried up at the angles of the building, and then returned horizontally along the front, owing to which the architrave itself (epistylium) appears to be returned downwards, like that of a door or window. This will be at once understood by referring to the view of Denderah on the opposite page, by which it will also be seen that the cornice consists of little more than a deep cove, enriched with sculpture; a form peculiarly adapted for effect in a climate like that of Egypt, as it not only casts a bold shadow but receives a strong reflected light.

With the cornice the building terminated, for the roof being a flat terrace, there was no indication of roof; consequently Egyptian architecture is entirely destitute of what are such expressive and highly ornamental features in that of Greece, namely, the pediment, antifixæ, and ridge tiles. By way of indemnity for its deficiency in this respect, and the sameness arising from it, greater latitude was allowed to it in others. Not only was there far greater diversity in the forms and ornaments of columns, which do not appear to have been subject to any regulations beyond those prescribed either by symbolic allusions or by national taste; but columns of very different character appear in the same edifice, and even capitals of different design in the same range of columns; wherein again a kindred spirit may be observed between Egyptian and Gothic architecture, notwithstanding that in treatment they are so dissimilar from each other. Another thing peculiar to Egyptian buildings is the frequent use in the external porticoes of temples of intercolumnar walls, or screens, that is, walls built between the columns and carried up half their height; thereby giving to the open part of the intercolumns above them somewhat the appearance of windows. For an example, we again refer to the view of Denderah, in which instance these walls are brought forward so as to encase the shafts of the columns between them, and fling a shadow upon them. Like every other part of the front in the same edifice, these walls are decorated with sculpture and hieroglyphics; for the Egyptians were exceeding lavish of that species of embellishment, not confining it to particular situations, as did the Greeks, namely to the pediment, frieze, and inner frieze behind the columns, along the walls of the cella, but extending it over the entire surface, in compartments forming tier above tier. These architectural sculptures were generally in very low relief, and some of them also occasionally in intaglio, or hollowed into the surface instead of projecting from it. There are even instances of a combination of both modes, the figures being outlined by a groove or incision, so as to give them greater apparent relief; a mode that has been denominated by some intaglio-rilevato. In addition to this species of enrichment may be added that of colours and gilding, especially in the interior and upon beams and ceilings. In this respect, however, the Greeks displayed a similar taste; for it has been recently established beyond all doubt that their temples were decorated with colours and gilding, externally as well as internally, even those of the Doric order, where what have hitherto been considered mere plain mouldings and surfaces, because they were unsculptured, were, in fact, highly ornamented, and frequently with embellishments remarkable for their delicacy.

Having thus given some notion of the elementary parts and features of Egyptian temples, we proceed to describe their general plan and distribution, selecting by way of explanatory illustration the ground plan of the temple at Edfu, or Apollinopolis Magna, one of the largest in Egypt.

This, it will instantly be seen, was far more varied and complex than the plan adhered to by the Greeks, which, as has been shown in the article CIVIL ARCHITECTURE, consisted merely of a cella, either surrounded entirely with columns, or with columns only in front, or at both ends. Here, on the contrary, the temple is placed within an enclosure, forming a court in front of it, surrounded on three of its sides by colonnades; and the entrance to this court was through a colossal doorway, or propylæum, placed between two enormous pyramidal towers, or moles, covered with colossal figures in sculpture. These vast masses of structure, which rose considerably higher than the temple itself, had the usual cornice, and likewise the torus moulding running up their angles. Other conspicuous objects frequently accompanying such propylæa, were lofty obelisks, as was the case at Luxor, where there still exists one in front of each mole. These moles may almost be said to be solid, for although they contained chambers and staircases, such spaces amounted to no more than voids left in the mass. Within the court the colonnades were pycnostyle, which seems to have been the usual mode of intercolumniation adopted by the Egyptians, the columns being seldom more than a diameter and a half from each other, except in the centre of a portico, where there was generally a doorway between the columns, the lower part of the other intercolumns being walled up, as described above, and as shown in the view of Denderah. Such is the case in that of Edfu, which also agrees with the one just mentioned in the number of its columns in front. Owing to their being enclosed at their extremities, both these examples answer to a Greek hexastyle in antis [Civil Architecture], or an octastyle; because although there are but six columns, there are seven intercolumns. They agree, too, in having other rows of columns within, parallel to those in front; but in this respect that at Denderah is richer than the other, for while it has three inner ranges of columns, that at Edfu has only a couple. Even this, however, exceeds what we meet with in Grecian buildings, where there is only—neither is that very general—a single row of columns in antis behind those in front, forming the pronaos or vestibule to the cella—for being inclosed not only at its sides, but in front, by the intercolumnar walls, it answers more to the character of a *pronaos* than a portico. The plan of such structures as the propylæa at Athens and Eleusis corresponds more with that of an Egyptian portico than does any thing else in Grecian architecture; they being, like the latter halls, open in front and enclosed at their sides or ends, and having files of columns within. Beyond this portico, or first hall, is one of smaller extent, passages being cut off at its ends by exceedingly thick partition walls. This has three rows of four columns each, so disposed as to occupy the whole area, leaving merely narrow aisles in every direction between them—a mode peculiar to Egyptian architecture, occasioned by the necessity for employing such thickly-set columns to prop the massive beams and slabs of stone composing the ceiling; and hence such apartments have obtained the name of *hypostyle* halls. It is hardly necessary to observe that they are altogether different from what has oddly enough acquired the title of an 'Egyptian hall' in this country (for instance, the large room in the Mansion House, London; the entrance hall at Holkham, &c.), which, besides being utterly unlike Egyptian architecture as to style, has merely a peristyle of columns, or else only colonnades along the sides. To this hypostyle succeed two chambers, the farther one having smaller lateral rooms attached to it, which, it is conjectured, were appropriated to the use of the priests; and facing its entrance was that leading into the *sekos* or shrine containing the figure of the deity. While all the preceding vestibules and chambers are placed transversely to the longitudinal direction of the building, the last and innermost apartment is parallel to that direction, and in continuation of the line of approach; the reason for which is obvious enough, it being almost indispensably requisite that the statue of the divinity should be at one end, and directly facing the entrance. In all probability likewise the object aimed at in disposing the rest as we perceive it to be, was twofold; first, for the sake of having a greater number of apartments to be crossed before the sanctuary was reached and thus rendering it more difficult of access and more mysterious; and secondly, for the sake of contrast; the other divisions of the plan being intended to be merely passed through, but this, on the contrary, being the termination of the whole. If we keep this in view, and the peculiar nature of the worship to which these temples were dedicated, the arrangement must be allowed to be judicious and appropriate, notwithstanding that under different circumstances it might be objected to as constituting a very strong anti-climax, since every portion of it successively diminishes, the last of the sacred chambers being, as the plan shows, hardly equal to the space forming the great doorway between the two moles. Yet what is thus an anti-climax, if we have regard to dimensions alone, became a perfect climax that must have made a powerful impression on those who were allowed to penetrate into the *adytum* the most sacred part of the fane—the presence chamber, as it were, of the presiding divinity, where the sanctity of the whole precinct was concentrated in a focus, and to which the magnificence and colossal grandeur of all the rest served merely as preparation and prelude.



Plan of the Temple of Edfu.

The figures in the plan are feet and decimal parts of a foot.

Such was the general disposition and distribution of an Egyptian temple, which, besides other very obvious distinctions, differs from those of Greece in the columns being situated chiefly within the building, for even the colonnades may be considered in some degree to be so, with respect to the entire plan. The portico, again, was neither *prostyle*, or advanced before the body of the temple itself, nor *peristyle*, that is, continued around it, but enclosed by the lateral walls, as is the case with a Greek temple in antis. Except in the particular instances already alluded to, columns are of very rare occurrence within Grecian edifices, except they were of large dimensions and *hypæthral* (like the Parthenon), that is, open to the sky, having no roof except over the aisles between the walls and the colonnades along them. A court-like area of this latter description was altogether different in character from the hypostyle halls within Egyptian temples, which, owing to the multiplied files of columns and the narrowness of the intercolumns, presented the appearance of a grove of pillars; and had it not been for the great diameter of the columns themselves, their being set so close together would have been no small inconvenience. But the columns themselves were generally of such prodigious bulk, that the space of a diameter and a half between them would generally be equal to about eight or ten feet, and in some instances to much more. In the vast hypostyle hall at Karnak, which is about 338 feet by 170 in extent, and has 134 columns disposed in nine parallel rows one way, and sixteen the other, the smaller pillars are nearly nine feet in diameter, and the larger almost eleven. In comparison with such enormous dimensions both in this and every other respect—for the whole structure extends several thousand feet—the most astonishing works of Roman and of modern architecture shrink into insignificance—even the Colosseum and St. Peter's, and the largest Gothic cathedrals, cease to appear astonishing in point of magnitude.

Some particulars remain yet to be noticed in respect to the temple at Edfu. Instead of being level, the court has a slight ascent towards the front of the temple; not however in one continued slope, but in a succession of low and very wide steps, each being the width of a column and intercolumn, as indicated by the plan; and the columns around the court are not so lofty as those of the portico, whereby the temple itself acquired greater dignity. Of these latter the capitals are bell-shaped, but not uniform as to design; while those of the pillars in the hypostyle hall have quadrilateral capitals with the four Isis' faces similar to those at Denderah. This hall, again, is not so lofty as the outer one or portico, but the height is proportioned to its other dimensions.

As in Grecian, so in Egyptian architecture, doorways are conspicuous and important features, more particularly in the latter, where they occur as distinct parts of the design in the form of propyla; sometimes standing quite insulated after the manner of arches or gateways; yet more usually placed between and connecting two pyramidal moles that rise to a great elevation above the propylon itself; consequently such entrance is both lower and narrower than the parts attached to it; which is altogether contrary to what is observable in Grecian composition, where the centre is, if not uniformly more elevated than the rest, at least not depressed; whereas there is here something analogous to what we observe in the façade of a Gothic cathedral, where the portail and body of the church are similarly flanked by towers. In its general form the propylon or gateway resembled the temple itself, yet with this difference, that the proportions of the one are lofty and narrow; of the other, wide and low, and its opening filled with columns supporting the lintel or epistylium. Their similarity in all other respects is obvious enough, owing to the epistylium of the portico being returned and carried downwards just as the lintel of the door is in order to form its jambs. The outer angles are similarly inclined in both cases, and ornamented with the same torus moulding on their edge. It should be understood, however, that the jambs of the doorway were, for the most part, not vertical next the opening, but sloped like the external angles, so that the aperture was narrower at top than at bottom, which form seems to have been copied by the Greeks in that of their doors and windows. The lintel and cornice above it were also proportionably much deeper than the epistylium and corresponding member, over columns, in order to produce sufficient mass; otherwise the effect would have been both unarchitectural and disagreeable, too much like that of the mere framing of a door, standing, although not quite insulated, yet distinct from the rest of the composition. Some idea may be given of the imposing magnitude of such doorways or propyla, by stating that the one at Edfu measures 74 feet to its summit, and 51 to that of the aperture, which gives a depth of 23 feet, or nearly one-third of the whole height, for the lintel and cornice.

The magnificence of these propylæa was greatly enhanced by colossal statues or obelisks—in some instances both—placed on either side of the entrance. Besides which there were sometimes two or even more propylæa and courts preceding the temple, which were in their turn preceded by avenues of gigantic sphinxes or crio-sphinxes (that is, sphinxes with rams' heads). There are, likewise, instances of avenues of columns crossing the courts in a line from the entrance. The remains at Luxor furnish an example of the kind, where, after the first court (which has a double peristyle), there is a second with a double range of columns extending down it, that are 11½ feet in diameter and 56 high, and beyond this was a third court, flanked by colonnades, consisting of double rows of pillars.

Having thus far given a sketch of the leading characteristics of the Egyptian style, in respect to the principal forms and details, together with their disposition and the arrangement of the buildings themselves, we shall touch very briefly upon the subject of the pyramids, because, interesting as they are in themselves, they are structures of so very peculiar and distinct a nature, as to have but little connection with the architecture of the country in general, being, when considered with reference to it, little more than uniform and simple, although enormous masses. They are, in fact, greatly more important in an historical and archæological point of view than in one purely architectural. Their shape is so familiar to every one that it requires no description, but may be defined as square in plan and triangular in section, its four sides being as many triangles united so as to terminate in a point; and as the height is much less than the width of the base, each side constitutes nearly an equilateral triangle. Hence, to say nothing of the amazing difference in regard to bulk and dimensions, an Egyptian pyramid is altogether dissimilar in character from a Gothic spire, notwithstanding that Murphy and some other writers have considered it the prototype of the latter. The magnitude of these singular erections, to which there is nothing corresponding in the architecture of any other country (except in Mexico), will be rendered more striking by observing that the base of the great pyramid is of the same dimensions as the area of Lincoln's Inn Fields, namely, about 700 feet square and 450 in height, while the corresponding admeasurements of the second and third pyramids are 650 feet and 280, and 400 and 160. Owing to these proportions, which in the latter case are much lower than those above stated, the extraordinary height is combined with imperishable stability and solidity, the whole being nearly one entire mass of the hardest materials, for the inner galleries and chambers form but mere veins and cavities compared with the entire mass.

In the Great Pyramid three chambers, hitherto undiscovered, have been lately (1836-7) explored and opened by Colonel Vyse. The largest, measuring 38 feet 1 inch by 17 feet 1 inch, has been denominated by him the 'Wellington Chamber;' the second (38 feet 9 inches by 16 feet 8 inches) named 'Nelson's;' and the third (37 feet 4 inches by 16 feet 4 inches) has been named after Lady Arbuthnot, who was present at the time of the discovery. These chambers vary as to height, and the blocks of granite which form the ceiling of the one below serve as the pavement to the next above it. According to the colonel, were chiefly intended as voids in that portion of the pyramid above what is termed the King's Chamber,—the only one that appears to have had any destination—and thereby to lessen the superincumbent mass.

Notwithstanding Egyptian architecture is so dissimilar in its character, in the taste and feeling manifested by it, from every modern style founded upon that of the Greeks and Romans, as to offer little that can be directly applied to any modification of the forms we are accustomed to; it is highly worthy of study by professional men, were it only on account of the beautiful and picturesque arrangements, the skilful contrasts, and varied harmony in the distribution of plan, which it exhibits. For our buildings in general it would be utterly inappropriate, but it might be adopted both with propriety and economy in such as require the expression of massive strength: namely, prisons, manufactories, propylæa entrances to railroads, and works of that description; for which purposes it has been recommended by Dr. Macculloch. Neither need it be an objection that it is quite as remarkable for the high finish and multiplicity of ornament, as for its other qualities; because, apart from all that is merely decorative, it is well calculated to produce effect by its forms and masses alone. It must also be admitted that, although its chief monuments are of colossal bulk and extent, such magnitude is not absolutely essential to the style itself, since there are many moderate-sized edifices still remaining; among others, the temple of Dandour, which does not exceed 22 feet by 44, a scale not very extravagant even for a mere ornamental building in a garden.

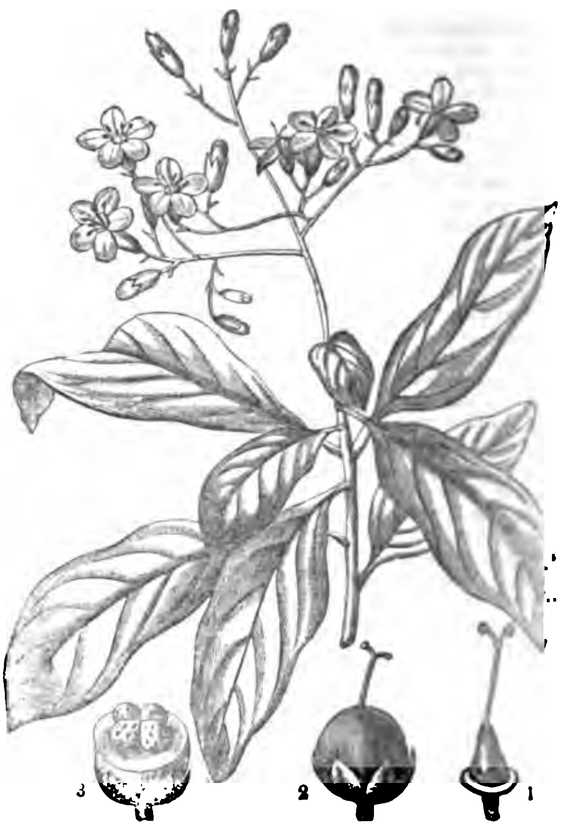
We cannot here, as in the article on Civil Architecture, refer to actual examples at home: still there are two buildings in the metropolis which, as far as single features and details go, may be cited as specimens of Egyptian architecture, viz.: the 'Egyptian Hall,' Piccadilly, and a smaller structure in Welbeck-street. The latter was, as originally erected, the most correct in point of character, but has since been almost spoiled by very barbarous alterations. The other conforms to the style only in certain peculiarities and separate parts, such as the columns, the general outline as indicated by the inclined torus-moulding at the extremities of the front, the cornice, &c., for the composition of the design itself is quite at variance with the principles of genuine Egyptian architecture, the front being divided into two floors with wide windows to both; whereas windows, wherever they do occur in Egyptian buildings, which is but rarely, are exceedingly small and narrow apertures; consequently the Piccadilly example must be looked at with some degree of mistrust. It must also be confessed that any imitation of the style is better adapted for situations where no other buildings would interfere with it, than for street architecture, where a building of such design will look small unless actually much larger than any of those around it.

Hitherto the taste of the Egyptians has been called in question, as being confined to a feeling for grandeur and magnificence, yet evincing very little refinement or perception of beauty. When examined with unprejudiced eyes, however, many of these forms, especially those of the bell-shaped and lotus-leaved capitals, will be found to possess much of the last-mentioned quality; while recent discoveries in the palaces, tombs, and temples of Upper Egypt, communicated to the world in the splendid publications of Rossellini and others, show not only the great variety and taste manifested in decoration and embellishment of every kind, but prove that many ornamental forms we have been accustomed to consider as essentially Greek, and have imitated as such, are really Egyptian. This is rendered strikingly evident by the delineations given in Rossellini of the various pieces of furniture, musical instruments, vessels of gold and silver, and other articles, from the royal tombs and palaces; and in regard to which luxury and refinement appear to have attained the highest pitch. Not only their archetypes, but even the express forms, till now attributed to the Greeks exclusively, are thus shown not to have been of their invention, but borrowed by them from the Egyptians, in like manner as they have since been copied by ourselves, while ignorant of their real origin. In consequence of this highly curious and important discovery, it is exceedingly probable that the subject of Egyptian architecture will engage attention in a much greater degree than it has ever before done.

EGYPTIAN BEAN, a name sometimes given to the bean-like fruits of Nelumbium speciosum, from the notion that they were the beans which the disciples of Pythagoras were forbidden to eat.

EHRENBREITSTEIN, a township on the right bank of the Rhine, in the circle of Coblenz, and in the Prussian province of the Lower Rhine. It contains one town and eight villages, with about 6400 inhabitants; an increase of 568 since the year 1817. The town is called Thal Ehrenbreitstein (Vale Ehrenbreitstein), and is situated at the foot of a precipitous height 772 ft. in elevation, opposite to Coblenz, in 50° 23′ N. lat. and 7° 36′ E. long. It occurs in records of the year 1210 under the name of Mulne or Mullenheim; but in 1533 the name appears to have been changed into Mühlheim and Müllenthal, probably from the number of mills in the valleys of two rivulets close to it. It contains 2 Roman Catholic churches, a synagogue, 11 public buildings, 9 mills, about 270 dwelling-houses, and 2400 inhabitants. The electoral palace is in a state of great decay. The town has a tobacco manufactory; the acidulous spring in the town is of some repute; and it has a brisk trade in wine, corn, iron, clay for tobacco-pipes, &c. Above the town stands the fortress, which has been entirely reconstructed since the year 1817, with the addition of three forts on adjacent heights, which command the mouth of the Moselle and the access to it from the Lower Rhine. These are, Fort Alexander, on a height in front of Coblenz; Fort Francis, on St. Peter's Hill, on the left bank of the Moselle; and the Pfaffendorf redoubt, opposite the flying bridge across the Rhine. The road up to it from the town is about 1200 paces long; it is fortified, and rests almost entirely upon arches built over the chasms in the rock of which the height consists. The 'Cavalier,' or highest point of this formidable stronghold, is not accessible to strangers, as it affords a full view of the detail and interior of the defences; but the prospects from other points are extensive and beautiful. According to Professor Klein, the Romans had a watch-tower on this height in the times of the Emperor Julian; subsequently the Franks built a burg or castle on the site; and in 1153 it was restored, enlarged, and fortified by the then archbishop of Treves. In 1632 it fell into the hands of the French, whom the Imperialists drove out by famine in 1637. In 1795, 1796, and 1797 it was blockaded by Generals Marceau, Jourdan, and Goullus successively; and in 1799 it surrendered to the French, who the next year razed all its fortifications.

EHRETIA'CEÆ, a small natural order of exogenous plants consisting of shrubs or trees inhabiting the warmer countries of the world, and having rough leaves, monopetalous regular flowers, a definite number of stamens, a superior ovary, a two-lobed style whose divisions are capitate, and a nucamentaceous undivided fruit. The flowers are more or less gyrate, and the order itself, which contains no species of economical value, is so near Boraginaceæ as to render it doubtful whether it ought to be separated. The common heliotrope is the most generally known representation of Ehretiaceæ, forming however the type of a sectional division, characterized by the fruit being dry, not succulent.



Beurreria succulenta.

1, An ovary with the style and double stigma; 2, a ripe fruit with the calyx at the base; 3, a section of the same showing the seeds.

EICHHORN, JOHANN GOTTFRIED, an eminent professor of oriental and biblical literature in the university of Göttingen, and one of the most learned and distinguished scholars of Germany, was born in 1752, at Dorrenzimmern, in the principality of Hohenlohe Oern[illegible], and at first was rector of the school at Ohrdruf, in the principality of Gotha. Having applied with great success to the study of the oriental languages, he obtained, in 1[illegible], a professor's chair in the university of Jena, where he continued thirteen years, giving instruction in Hebrew, Ar[illegible] &c., and was made, in 1783, a court councillor by the duke of Saxe Weimar. In 1788 he was appointed to the professorship previously held by Michaelis in the university of Göttingen, of which institution he continued a very distinguished ornament during the remainder of his life, as professor of oriental and biblical literature.

His reputation was equally high as a proficient in oriental, classical, and scriptural antiquities; in philosophical criticism; in the history of nations, and of antient and modern literature and science; and in universal bibliology. He was made, in 1811, a doctor of divinity; in 1813 the directorship of the Royal Scientific Society of Göttingen was conferred on him, and the office of pro-rector of that university; in 1819 he was appointed privy councillor of justice for the kingdom of Hanover (Geheimer Justizrath). [illegible] died in 1827, on the 25th of June, at the age of 75. The few incidents, which appear to be all which are published, verify the trite observation that the secluded lives [illegible] students furnish but scanty materials for biographical memoirs. In completing the present notice it is therefore only necessary to enumerate the principal works of Eichhorn, and to give a brief and general account of his doctr[illegible] as a divine and critic.

The following statements are made, partly from an examination of the works enumerated, and partly on [illegible] authority of several German bibliographical publications and the last edition of the Conversations Lexicon (3rd [illegible] 1833). While at Jena, Eichhorn first displayed his knowledge of Oriental literature in a history of East In[illegible] commerce prior to the time of Mohammed (Geschichte [illegible] Ostind. handels vor Mohammed), Gotha, 1775. This [illegible] followed by a survey of the most antient monuments of [illegible]

Arabs (Monumenta antiquissima Historiæ Arabum, post Schultensium collecta atque edita, cum animadversionibus), Gotha, 1775; and a treatise on the ancient numismatical history of Arabia, Gotha, 1775. He next published a large collection of learned and valuable treatises, entitled a Repertorium of biblical and oriental literature (Repertorium für biblische und morgenländische Litteratur), 18 vols. Leipzig, 1777-86. After removing to Göttingen he devoted his attention almost exclusively to the archæology of biblical literature, and the results of his studies appeared in a general repository of biblical literature (Allgemeine Bibliothek der biblischen Litteratur) 10 vols. 1787-1801; and in a disquisition on primitive history (Urgeschichte) 2 vols., Altdorf and Nürnberg, 1790-93, with an introduction and notes by the learned Gabler. This work contains a searching and bold criticism of the Mosaic Pentateuch. The two next are among the most important of the author's productions, namely, the introduction to the Old Testament (Einleitung in das Alte Test.) of which a 4th and improved edition, in 5 vols., appeared at Götting. in 1823; and the introduction to the New Testament (Einleitung in das Neue Test.) new edition in 2 vols. 1827. These were accompanied with an introduction to the apocryphal writings of the Old Testament (Einleitung in die apokryphischen Schriften des Alten Test.) Leipzig, 1795, Götting. 1796; and a revised and uniform edition of the three, with the title of Critical Writings (Kritische Schriften) was published at Leipzig in 7 vols. 1804-14.

The other works of Eichhorn on biblical criticism and philology are a commentary on Revelations (Commentarius in Apocalypsin Joannis) 2 vols., Götting. 1791. A revised and enlarged edition of Professor Simon's Hebrew and Chaldaic Lexicon, Halle, 1793. A critical translation and exposition of the writings of the Hebrew prophets (Die Hebräischen Propheten), 3 vols. Götting. 1816-20. Commentaries on the prophetic poetry of the Hebrews (Commentationes de Prophetica Poesi Hebræorum), 4to., Götting. 1823. Preface to the 'Nova Bibliotheca Hebraica' by Koecherus; and numerous critical treatises in a learned periodical work entitled Mines of the East (Fundgruben des Orients); and in the Commentaries of the 'Göttingen Royal Society of Sciences' (Commentarii Societat. Reg. Scientiarum Gottingensis).

In 1796 he published the plan of a comprehensive history of arts and sciences from their revival in Europe to the end of the 18th century, and wrote, as a part of the work, a general history of civilization and literature in modern Europe (Allgemeine Geschichte der Cultur und Litteratur des neuern Europa), 2 vols., Götting., 1796-99. The History of modern Poetry and Eloquence, by Bouterwek, and the History of Military Science, by Hoyer, constituted other parts of the undertaking, which was left unfinished. The first three parts and the fifth part of a similarly extensive and uncompleted work were written by Eichhorn, namely the History of Literature, ancient and modern, from its commencement to the present time (Geschichte der Litteratur von ihrem Ursprunge bis auf die neuesten Zeiten), 6 vols., Götting., 1805-11. He also wrote Literary History (Litterärgeschichte), 2 vols., Götting., 2nd edition, 1813-14. A History of all parts of the world during the last three centuries (Geschichte der drey letzten Jahrhunderte, &c.), 6 vols., Götting. 3rd edition, 1818. An Historical Survey of the French Revolution (Uebersicht der franz. Revolution), 2 vols., Götting., 1797. And a Universal History (Weltgeschichte) on the plan of Gatterer's universal statistics (Weltstatistik) 4 vols., Götting. 3rd edition, 1818-20. The two following laborious and judicious compilations have obtained a high repute in the schools of Germany, namely, a History of ancient Rome, composed entirely of connected passages from the ancient Roman writers (Antiqua Historia ex ipsis veterum script. Roman. narrationibus contexta), 2 vols., Götting., 1811; and a History of ancient Greece, constructed on the same plan, from the ancient Greek historians (Antiqua Historia, &c.), 4 vols., Leipzig, 1812. His last important work was a curious research on the early history of the illustrious house of the Guelphs, in which the ancestors of the present royal family of England are traced up to the middle of the 5th century (Urgeschichte des erlauchten Hauses der Welfen, von 449-1055), 4to., Hanover, 1817. From the year 1813 to his death in 1827, Professor Eichhorn was the editor of the Göttingen Literary Gazette (Göttingische gelehrte Anzeigen.) His critical writings display extensive and exact learning, which in his biblical treatises he employs for the development of doctrines often the reverse of those which are generally regarded as orthodox. As a divine, his character, with reference to one of his principal works, is thus described in Orme's Bibliotheca Biblica (p. 166): 'Professor Eichhorn is the Geddes of Modern Germany, and has performed for the Old Testament what Michaelis, whom he succeeded, did for the New. Possessing the erudition, the diligence, and all the bold free-thinking of his celebrated predecessor, he introduces the Old Testament by demolishing its authority, by denying its inspiration, and by calling in question the antiquity of its chief historical documents.' It is added, that many of the author's opinions can meet with few supporters in England, except among those who arrogate the title of rational divines; and that the work is noticed only on account of its celebrity in Germany; a statement strangely inconsistent with the fact of its being in the hands of every learned student of divinity in Europe and America. Eichhorn applies to the Hebrew Scriptures the principles on which Heyne explained the mythology of the Greeks, and his name is conspicuous in the theological school commenced by Michaelis and Semler, and extended by Rosenmüller, Kuinoel, Döderlein, Rohr, Teller, Schmidt, Henke, Ammon, Steinbart, Wegscheider, &c., as an ultra rationalist, and a promoter of the system of *logical* religion and morality, founded on the Kantian transcendental theory of ideology, so generally prevalent in the universities of Germany, and which in truth is a system of mere moral philosophy and philosophical theism, exhibited under the ostensible profession of Christianity; since all traditionary doctrines and statements are made to give way to the operation of 'abstract, universal, and eternal principles of reason.' By his superior knowledge of Oriental antiquities, and by his bold mode of thinking, Eichhorn established a new system of scriptural explication, in which he displays a degree of learned and philosophical scepticism much beyond that of his predecessor Michaelis. He denies all supernatural revelation to the Hebrew prophets, believing them to have been clever and experienced persons, who, from their peculiar abilities, were likely to foresee political and other events. He examines, questions, and rejects the authenticity of several books of the Old Testament, and of some of the epistles in the New, and asserts generally that miraculous appearances, visions, voices, &c. are explainable by the laws of nature and the principles of human physiology and psychology, and that supernatural communications are chiefly referable to the mysterious traditions and superstitious notions common to all people in a state of ignorance and barbarism. His theory of the origin of the canonical gospels which regards them as compilations from anterior documents has been adopted by many subsequent critics. (See Dr. Schleiermacher's work on the Gospels.) Many of the sceptical positions of Eichhorn have been attacked in Germany by the anti-rationalist class of divines. On this point see 'The Present State of Protestantism in Germany,' by the Rev. Hugh Rose, 2nd edition, 1829, and the controversial publications which it elicited.

EICHSTÄTT, a bailiwick in the circle of the Regen, and in the west part of Bavaria. It gives the title of Prince to the duke of Leuchtenberg, and forms a portion of his mediatised possessions in the Bavarian dominions. The country, which is mountainous and well wooded, is traversed by the Altmühl: it produces grain, flax and hemp, hops, timber, iron, potters' clay, slate, &c.

EICHSTÄTT or **EICHSTÄDT**, is a handsome town situated in a narrow but productive valley on the left bank of the Altmühl, across which four bridges have been built. It is the residence of the duke of Leuchtenberg, as well as of a bishop. It lies in 48° 53′ N. lat., and 11° 10′ E. long. The town is walled round, has four suburbs, about 960 houses, and a population of about 7500, distributed in three parishes. It has an ecclesiastical seminary, a Latin or grammar-school, a capuchin monastery, a nunnery, an hospital, an orphan asylum, and other charitable institutions, a cathedral church and chapter, and four other churches. Among the buildings of note are the ducal palace, with the celebrated Brazilian cabinet, a library and museum of antiquities, the fine arts, &c.; the cathedral church; and the burg or stronghold of St. Willibald, which overlooks the town from the summit of the mount of that name, and has a well 1200 feet deep. This burg is said to be on the site of Auresium, a Roman castle, and was the abode of the first bishop, Willibald, who was the builder of the cathedral church and the adjacent dwellings for his clergy, in the middle of the eighth century. For this purpose he cleared an area covered with oaks, whence the town derives its name of Eichstädt, or town of oaks. In the romantic grounds called Aumühlwald, near this place, is a tablet of cast-iron, set in a block of marble, 198 feet square, and laid into a mass of rock: it was erected by the citizens in memory of Eugene Beauharnois, step-son of Napoleon, and viceroy of Italy. This prince was afterwards duke of Leuchtenberg, and prince of Eichstädt. The town manufactures woollens, earthenware, beer, iron ware, &c., and has quarries in the neighbourhood.

EIDER. [DENMARK.]

EIDER-DUCK. [FULIGULINÆ.]

EIGHTH (in music), the octave or eighth note of the diatonic scale. It is a perfect concord [CONCORD], and in harmony is accompanied by the 5th and 3rd; but being almost identical with the base note, it may form a part of any chord, or be omitted at discretion.

EIKON BASI'LIKE. [CHARLES I. OF ENGLAND.]

EILENBURG, a town in the county or administrative circle of Merseburg, and in the minor circle of Delitsch, which, before its transfer to the Prussian crown, formed part of the circle of Leipzig in Saxony. It is situated on an island of the Mulde, in 51° 28′ N. lat., and 12° 37′ E. long. The town is surrounded by walls and ditches, and has two gates and a bridge over each arm of the river, four suburbs, an old castle, two churches, an hospital, and infirmary, a civic school, about 640 houses, and 6300 inhabitants. The manufactures consist of cottons, bleached wax, starch, vinegar, brandy, woollen-yarn, crucibles, &c.

EIMBECK or EINBECK, the chief town of the former principality of Grubenhagen, which is now incorporated with the principality of Göttingen, a portion of the Landrostei or bailiwick of Hildesheim in Hanover. It is encircled by two arms of the Ilm, and lies in 51° 48′ N. lat., and 9° 51′ E. long. The walls which enclose it have five gates; the streets are crooked and ill-paved; and the houses, about 780 in number, are old and originally built in the middle ages. The number of inhabitants was 4995 in 1812, and is at present about 5150. It has three churches (one of which, St. Alexander's, contains the sarcophagi of the princes of Grubenhagen, and has a chapter attached to it), an orphan asylum, where woollen yarns are spun, two hospitals, a refuge for the indigent, a gymnasium or high school, and six elementary schools. The church of the Blessed Virgin has likewise a chapter attached to it. Eimbeck, besides a considerable traffic in agricultural products, possesses manufactories of woollens, cottons, tobacco, linens, leather, beer, &c., and there are large bleaching grounds outside the walls.

EIRE'NE. (Zoology.) [MEDUSA.]

EISENACH, a principality in the centre of Germany, forming the western portion of the grand duchy of Saxe-Weimar-Eisenach, from which it is disjoined by the intervention of part of the Prussian province of Erfurt, and the Saxe-Coburg-Gotha territory. It is bounded on the north by Prussian Saxony, on the north-east by the principality of Gotha, on the south-east by Saxe-Meiningen, on the south and south-west by Bavaria, and on the north-west by the electorate of Hesse-Cassel. The detached district of Ostheim, also part of Eisenach, lies to the south within the Bavarian confines, and there are likewise other small and detached portions of the Eisenach territory within the boundaries of Gotha and Saxe-Meiningen. The principality is of greater extent than it formerly was, since it now comprehends the bailiwics of Lichtenberg, Kaltennordheim, Geiss, Dermbach, Vach, Frauensee, Völkershausen, and some minor tracts, which have been acquired by cession or exchange from the territories of Fulda, Henneberg, and Hesse-Cassel. Its area is about 440 square miles, rather less than a third part of the grand duchy of Saxe-Weimar-Eisenach; and it has a population of about 78,500 souls; in 1818, the numbers were 65,349, and in 1835, 77,729. The greater part of this principality belongs to Thüringia, and a considerable portion of it is traversed by the Thüringian Forest mountains (*Thüringer-Wald-Gebirge*); between which and the Rhön mountains the principality comprehends a tract about forty-two miles in length, and from nine to fourteen in width. The country presents a succession of hills and mountain-heights, uninterrupted by any extensive levels, and the soil is consequently not very favourable to cultivation. It is watered by the Werra, with its tributaries, the Nesse and Hörsel, Ulster, Fulda, Sulz, Suhl, and Vach. The climate is pure and healthy, though, from the proximity of the Thüringian heights, it is variable and not so mild as in Franconia and on the Rhine. The products consist of grain, which is not adequate to the consumption, timber, potashes, and tar, rape-seed, flax, hemp, hops, fruit, &c. Horned cattle and sheep are reared in great numbers, as well as swine. Mining has been much neglected; copper, iron, vitriol, alum, and coals, in small quantities, are obtained; and there are quarries of stone and marble, as well as salt-springs near Kreutzburg, from which about 500 [illegible] of salt are annually extracted. Potters' clay and fuller's earth are found. There is more mechanical industry in Eisenach than in Saxe-Weimar: its principal manufactures are linens, woollens, cottons, iron and copper ware, yarn, potashes, leather, earthenware, and articles of wood. Eisenach is divided into eleven bailiwics, and contains eight municipal towns, twelve market-towns, or villages with markets, and 130 villages and hamlets. The chief towns are Eisenach, Ruhla (3000 inhabitants, of whom 1800 are subjects of Saxe-Gotha), Dermbach (800), Geisa (17[illegible]), Berka (1000), Gerstungen (1300), Kaltennordheim (12[illegible]), Kreutzburg (1700), Lengsfeld (2100), Ostheim (2[illegible]), Vacha (1600), and Völkershausen (1000). The principality fell to the grand-dukes of Saxe-Weimar upon the decease of the last duke of Saxe-Eisenach, who left no issue, in the year 1741.

EISENACH, the chief town and seat of government of the principality of Eisenach, is situated at the confluence of the Hörsel and Nessel, which unite immediately north of the town, and then flow through it *in one channel*: the village of Fischbach touches it on the east; and the celebrated Wartburg, a mountain fastness, commands it on the south. Eisenach lies in 50° 58′ N. lat. and 10° 18′ E. long. It is surrounded by walls, has five gates, is well built, and has broad, clean, well-paved streets. It contains about 14[illegible] houses, and has about 9300 inhabitants; an increase of about 1042 since the year 1818, when the number was 8258 independently of the military. The grand-ducal palace, or house of princes (Fürstenhaus), a structure of the last century, is a large and handsome edifice. Among other public buildings there are five churches; a gymnasium, founded in 1233, with an extensive library; a handsome civic school which ornaments the spacious market-place, and was erected in 1825; a seminary for the education of schoolmasters; and an academy for young men designed for the profession of superintendents of woods and forests, an important branch of study in those countries where wood supplies the place of coals. Eisenach has also an agricultural institute for the instruction of youth intended for husbandry, a school of design, a free-school, as well as six elementary schools, a house of correction and orphan asylum, two hospitals, an infirmary, a school of industry for indigent girls, a bible society, and several philanthropic associations. The chief manufactures are woollens, cottons, linens, soap, white-lead, meerschaum heads of pipes, leather, and carpets. The original name of the town was Ysenach or Ysenacha: it was the abode of Hilten, who pre[illegible] Luther as a reformer of the church, and of Amsdorf [illegible] first bishop of Naumburg, and afterwards Luther's b[illegible] friend and fellow-labourer), who died here in 1565. [illegible] steep ascent through a fine park leads to the well-known stronghold called the Wartburg, which is about a mile [illegible] a quarter from Eisenach, and at an elevation of 131[illegible] feet above the level of the sea. The original burg was built [illegible] Lewis the Jumper in 1140, and was the residence of [illegible] landgraves of Thüringia until the year 1406: a large portion of it was rebuilt in the beginning of the present century. On this spot, in the early part of the thirteenth century, the minnesänger, or minstrels of Germany, used to contend; and it is still better known as the place of refuge or 'Patmos,' as Luther styled it, [illegible] which that great reformer was conveyed in 1521, on [illegible] way back from attending the Diet of Worms: here [illegible] found an aslyum for the ten succeeding months, which [illegible] devoted principally to his translation of the Scriptures. The little chapel in which he frequently preached, with [illegible] altar-piece, a fine carving in wood representing the entombment of Christ, and the cell which Luther inhabited, have been carefully preserved in the same state as when he used them. In the antient portion of the Wartburg a[illegible] also the Knights' Hall (*Rittersaal*), in which the minstrels held their poetic contests; and the Armoury, built in 1810, which contains relics of the paraphernalia of Pope Julius II., the Princess Cunigunda, and other personages. This hold is still protected by external works, and is now made use of as a prison. In the grounds between the Wartburg and the town is the remarkable rock on which the hand of Nature has sculptured the representation of a monk and nun.

EISENBURG, or in Hungarian Vas Vármegye, and Sclavonian Zelezno Mesto, a large county in the western part of Hungary, bounded on the north-west by the Austrian province 'below the Ens' (or Lower Austria), on the south-west and west by Styria, and on the east by the counties of Oedenburg, Veszprim, and Szalad. It contains an area of about 2047 square miles, which is divided into 5 circles, and has 1 royal free town (Güns or Köszeg), 1 episcopal town (Stein), 41 market towns, 612 villages, 67 prædia or privileged settlements, and about [illegible] inhabitants. The southern and western parts of Eisenburg are very mountainous, for here the Alpine chains which traverse Styria and the duchy of Austria terminate. The northern districts are hilly; but extensive and highly productive plains lie on both sides of the Kemenes, an elevated plateau on the right bank of the Raab. This river is the principal stream in the county, and flows through its southern parts, whence it takes a direction to the north-eastward: the three lesser rivers, the Pinka, Sorok, and Güns, which water the centre and western districts, fall into the Raab on its left bank. Eisenburg, though it has many forests, is on the whole a fertile and productive land; and it has been estimated that of the 1,050,000 acres available for useful purposes, 530,700 are already under the plough; 35,000 have been converted into vineyards; and the rest are occupied by woods and forests. Wheat, oats, barley and maize, peas and beans, and flax, are grown in abundance; the [illegible] tobacco is in repute; and much wine is made. There are many rich pasture lands, and the extensive forests, particularly the Farkas, afford plenty of timber and fuel. Large herds of horned cattle are kept, along the banks of the Raab especially; more pains are now bestowed on the breeding of sheep; poultry is extensively fed for the Vienna market; and there is much game. Near Bernstein, a mining district in the north-west of Eisenburg, large quantities of sulphur are dug; quicksilver, also vitriol, [illegible], and copper, are obtained here on a small scale. Coals are dug at Mariadorf. Marble and alum are likewise among the products of this county. The majority of the inhabitants are Roman Catholics, of whom there are about 170,000, and of Protestants about 60,000. They are as much distinguished by their mechanical as their agricultural industry, and have a good trade with various parts of Austria.

The most remarkable spot in Eisenburg is Stein-am-Anger (Szombathely), the Sabaria of the Romans, an episcopal town, lying between the Perenth and Güns, in 47° 13′ N. lat., and 16° 37′ E. long., with about 3500 inhabitants. This town, where the states of the county hold their meetings, as well as its environs, abounds in remains of Roman art, in columns, sepulchral tablets, votive stones, inscriptions, &c. The cathedral is a handsome modern edifice: the town has three other churches, an episcopal residence, seminary, and chapter-house, three monasteries, a Roman Catholic gymnasium, college of philosophy, county-hall, and other handsome buildings. At Tatzmannsdorf (Tarcza), a beautifully situated village in the north-western part of the county, there are excellent and much-frequented chalybeate springs. The dignity of Obergespan (or Head-man of the county) is hereditary in the Batthyáni family.

EISENSTADT (in Hungarian Kis-Marton), a royal free town in the Hungarian county of Oedenburg, finely situated in a noble expanse of country bounded by the Leitha mountain range, in 47° 53′ N. lat., and 16° 24′ E. long. It lies about 26 miles south-east of Vienna, and contains about [illegible] inhabitants. The town itself is walled round, has two gates, and three main streets, a church, and a Franciscan monastery, in which is the sepulchral vault of the Esterházy family, a monastery, and hospital of the Brothers of Charity, a town-hall, and the offices for the administration of the Esterházy domains. The 'Schloss-grund,' or palace-domain, is an extensive suburb, containing about 2600 of the population, and comprising the 'Judenstadt' or Jew's Town, where 500 of that community reside; here are Mount Calvary, laid out in conformity with the supposed disposition of the site in Palestine, and extolled in the eyes of the Roman Catholics by a miraculous effigy of the Virgin; and the palace called Kis-Márton, a splendid quadrangular structure, erected in 1805 by Prince Esterházy, to whose family the whole suburb belongs. The park is large, rises in terraces towards the Leitha hills, and is embellished with temples, a canal and cascades, an avenue of rose-trees, 292 paces in length, an orangery of 400 trees, nine large conservatories, containing nearly 70,000 plants, water-works impelled by steam, &c. Eisenstadt possesses a head-school, a Protestant public school, a town-hospital, and an institute for forest-economy. Much wine is brought here for sale.

EISLEBEN, formerly the capital of the earldom of Mansfeld, the chief town of the Mansfeld circle of the Lake, in the administrative circle or county of Merseburg, in Prussian Saxony. It is situated on an eminence on the banks of the Böse, in 51° 33′ N. lat., and 11° 32′ E. long., and in the vicinity of two lakes. The town has two main divisions; the Old Town, which is surrounded by walls and ditches, and has seven gates, and the New Town; besides these it has five suburbs. Eisleben contains altogether four churches, a Protestant gymnasium, several elementary schools, two hospitals, and has about 7300 inhabitants: between the years 1817 and 1831 the number increased from 5530 to 7256. The chief manufactures are potashes and tobacco; and there are copper and silver mines in the neighbourhood, with two smelting works. The town has a brisk inland trade. Luther was born here on the 10th of November, 1483, and died here on the 18th of February, 1546; but neither his parents nor himself had a permanent residence in Eisleben. The object of greatest attraction in it was the house in which he was born. After escaping several extensive conflagrations, it was at last destroyed by fire in June, 1689; and nothing was saved but a wooden table on which Luther's portrait was carved, an old engraving which also represented him, and a window, on the glass of which he and Melanchthon were pourtrayed in the old style. On the site of this house a more solid building of stone was soon afterwards erected, and on the 31st of October, 1693, it was solemnly consecrated to the purposes of a poor-house and free-school. This is the structure which is at present shown to visitors as Luther's house. A stone bust of the reformer stands over the entrance, with the well-known saying inscribed beneath it:

Gottes Wort ist Luthers Lehr,
Drum vergehet sie nimmermehr.

'The word of God is Luther's lay,
And it shall never pass away.'

The old portraits of Luther and Melanchthon on glass have been introduced into one of the windows. Over the door of one of the rooms is the portrait of Luther in wood, and beneath it is the distich,

Pestis eram Papæ [illegible] pestis et hujus;
Vox mea cum scriptis [illegible]
Anno post R. N. 1534, [illegible] renovata.

This inscription refers to the verse, 'Pestis eram vivens; moriens ero mors tua, Papa!' which Luther is said to have written at Altenburg in the year 1530, and was fond of quoting. Several articles are exhibited, such as what is called Luther's table, which in fact never was his. At St. Andrew's, the principal church in the town, the little pulpit in which Luther preached is still preserved. Sermons to his memory are regularly delivered from this pulpit on the days of his birth and decease, and on the first day of public catechizing. There are busts of Luther and Melanchthon in the same church. On the day of the jubilee of the Reformation in 1817, several additions were made to Luther's house, at the expense of the present king of Prussia, who bestowed a sufficient endowment to preserve it against future decay, and perpetuate its benevolent object.

EISTEDDFOD, from *eistedd* to sit, a meeting or assembly. This term was more especially used as the name for the session of the bards and minstrels which was held in Wales for many centuries. [Bard.]

EJECTMENT is the name of an action at law of a nature partly real and partly personal, and therefore called a mixed action, by which a party entitled to the immediate possession of lands or other corporeal hereditaments may recover that possession from the party wrongfully withholding it.

Since the disuse of real actions, and under the provisions of the 3rd and 4th Will. IV., c. 27, for the abolition of real and some mixed actions, it has become the only legal mode of trying the title to lands and tenements.

The remedy by ejectment is founded almost entirely upon a succession of legal fictions, and it is therefore necessary to give a short account of its history and the proceedings under it.

Originally this action was brought by any person having a lease for years of lands, &c., to repair an injury done him by dispossession; but gradually it became the means of indirectly bringing in question the title to the lands, which was thus collaterally tried with the supposed trespass. For this purpose it was necessary that the claimant should enter upon the lands in order to empower him to constitute a lessee for years who would be capable of receiving the injury of dispossession. A lease for a term of years is therefore stated in the declaration (for there is no other process in this action) to have been made by the party claiming title to the plaintiff, who is generally a fictitious person. It is also stated that the lessee, in consequence of the demise to him, entered into the premises, and that the defendant, who is also a fictitious person, and called the *casual ejector*, entered thereupon and ousted the plaintiff, for which ouster the plaintiff brings his action.

Under the declaration is a notice in terms professing to be written by the casual ejector to the tenant in possession of the premises, advising him to appear in court at a certain time and defend his title; otherwise he, the casual ejector, will suffer judgment to be had against him, by which means the actual tenant would inevitably be turned out of possession.

The declaration, as well as the notice, is then served upon the tenant in possession of the premises, who has thus an opportunity of defending his title. If he omits to do so within a limited time, he is supposed to have no right; and upon judgment being obtained against the casual ejector, the real occupier is turned out of possession by the sheriff.

If the tenant apply to be made a defendant, he is allowed upon condition that he enters into a rule of court to confess at the trial of the cause four of five requisites for the maintenance of the plaintiff's action—the lease of the lessor, the entry of the plaintiff, the ouster by the tenant himself, and the possession by the tenant. These requisites (except in certain cases, as of vacant possession, &c.) are wholly fictitious; and if the plaintiff should put the defendant to the proof of them, he would of course be nonsuited at the trial; but the stipulated confession of lease, entry, and ouster being made, the case then rests upon the merits of the title only. The cause goes to trial under the name of the fictitious lessee on the demise of the lessor, who is the person claiming title against the defendant.

The lessor is bound to make out on the trial his title to the premises; and if he do so in a satisfactory manner, judgment is given for the nominal plaintiff, and a writ of possession goes to the sheriff to deliver up the possession to him, under which process it is in fact delivered to his lessor, the real claimant. If it appears that the person claiming title to the lands has no right of entry, that is, no right to the immediate possession, he cannot maintain this action.

A mortgagee may maintain an action of ejectment against the mortgagor to gain possession of the mortgaged premises without giving any notice, unless the mortgagor is protected by the covenant for quiet enjoyment until default. He may also eject the lessee, to whom the mortgagor has made a lease subsequent to the mortgage, without giving him notice to quit. Where the right of the tenant to retain the possession has ceased by effluxion of time, by a legal notice to quit, or by the commission of an act of forfeiture, a landlord may bring an ejectment against his tenant; and various other persons who have a right of entry in law upon the premises may take advantage of the same remedy.

The time within which an action of ejectment may now be brought is regulated by the 3 and 4 Wm. IV. cap. 27, which enacts that no person shall bring an action to recover any land or rent (the meaning of which terms is explained by the first section of the act) but within twenty years next after his right to bring such action, or that of the person through whom he claims, shall have first accrued. The third section fixes the time at which the right shall be deemed to have first accrued. (Runnington *On Ejectment;* Adams *On Ejectment;* Blackstone's *Com.*)

EKATARINBURG or **YEKATARINBURG** (Ca[illegible] rine's borough), the chief town of a circle in the g[illegible] ment of Perm (Permia), in the western part of A[illegible] Russia, was founded by Peter the Great, in the year [illegible] who gave it the name which it bears in honour of his [illegible] It is situated on both sides of the Iceth or Iset, the [illegible] quarter of the town being built along the slope of a [illegible] acclivity of the Ural mountains. It is at an elev[illegible] about 860 feet above the level of the sea: in 56° 50′ N. [illegible] and 60° 41′ E. long. It is fortified and regularly [illegible] structed: the streets are long and straight, but th[illegible] unpaved, and have planks laid on each side of th[illegible] way of a foot-pavement. The greater part of the [illegible] are of wood, but there are many handsome stone bu[illegible] the chief of them form three sides of a square, th[illegible] side of which is the right bank of the Iceth: this [illegible] buildings is composed of the Mining Departm[illegible] Ekatarinburg is the seat of administration for the [illegible] mines), a museum of mineralogy, a public library, [illegible] cellent chemical laboratory, an imperial mint, w[illegible] cleansing and amalgamating metals, as well as for [illegible] and polishing precious stones, a school for [illegible] miners, a hospital, storehouses, a guardhouse, &c. [illegible] handsome bridge unites both quarters of the town. [illegible] the acclivity on the left bank of the river is a long r[illegible] wooden tenements where the work-people reside, w[illegible] stone residences of the public offices between them a[illegible] bridge. The merchants and dealers' houses in the [illegible] are also of stone, and would be an ornament to any [illegible] Europe. Besides five churches, there are a Greek m[illegible] tery, a public school for 300 pupils, a German sch[illegible] large bazaar, a magazine for grain, a house of corr[illegible] and several district and elementary schools. At the [illegible] western end of Ekatarinburg are remains of the f[illegible] tions where the garrison is quartered. The num[illegible] houses is upwards of 1200, and of inhabitants about [illegible] By the official return of the year 1830 they amount[illegible] 10,695. The population consists of a motley assem[illegible] Asiatics and Europeans, the latter principally Russ[illegible] Germans, among whom are numbers of persons ex[illegible] public offences. There is a public hall for drugs an[illegible] micals, and a botanic garden attached to the hospital. [illegible] greater part of the inhabitants depend upon the Ural [illegible] concerns for their subsistence; and as Ekatarinburg [illegible] the high road from Russia into Siberia, it is a p[illegible] transit and of brisk trade. In the neighbourhood [illegible] gold mines of Beresoff and the iron mines of N[illegible] which extend over a surface of nearly forty square [illegible] there is also a chalybeate well, which is much used [illegible] valids. A wood of pines encircles the north-western [illegible] mity of the town, and about half a mile beyond lies la[illegible]

EKATARINOSLAF, one of the three southern [illegible] vinces of Russia in Europe, which since 1822 have [illegible] tuted the government of New Russia. It is bound[illegible] the north by the provinces of Pultava, the Slobod[illegible] raine, and Voronesh; on the east by the territory [illegible] Don-Cossacks; on the south by the sea of Azof, a[illegible] government of Tauria; and on the west by the govern[illegible] of Cherson. There is an isolated district of this pro[illegible] of which Taganrog is the chief town, lying at the [illegible] western extremity of the sea of Azof, and separated [illegible] the remainder of Ekatarinoslaf by the territory of the [illegible] Cossacks. The area of this province is estimated by [illegible] at 23,700 square miles; but according to Ars[illegible] 28,980. Upwards of two-thirds of this area are a[illegible] steppe, destitute of wood, and adapted to pasturage [illegible] this is peculiarly the case with that large tract w[illegible] situated east of the Dnieper. The districts west [illegible] river are much more fertile, and are skirted by a r[illegible] hills which run northwards from Alexandrofsk along [illegible] Dnieper. Here it is principally that the arable la[illegible] Ekatarinoslaf, occupying about one-fourth of the s[illegible] situated. The whole extent of the woods and forests [illegible] not exceed 256,000 acres. The principal river is [illegible] Dnieper, which enters the province at its north-we[illegible] extremity, and, winding through the western parts [illegible] quits it below Alexandrofsk. The immense bl[illegible] granite which obstruct the course of the river at and [illegible] Kidak, give rise to thirteen beautiful falls, here c[illegible] 'paroghi;' and below them the river is divided by [illegible] into several channels. The Don skirts Ekatarinoslaf [illegible] at its mouth; but its tributary, the Donecz, waters [illegible] tially in the east. The other streams in this province [illegible] as the Samara, Kalmius, &c., are of no great importance. There are several lakes, the water of which is often much impregnated with salt: swamps are of frequent occurrence. The climate is mild, and not exposed to much variation, and the winter is of short duration. The quantity of grain produced is scarcely adequate to the consumption; in some years it is so scanty that the supply is drawn from foreign parts. Hemp and flax, peas, beans, lentils, vegetables, and fruit, particularly melons, are cultivated. The grape ripens, and some wine is made, but the fruits of the mulberry and walnut do not attain to maturity. The forests do not furnish sufficient timber or fuel; and straw, rushes, and even dung, are substituted for the latter. The chief kinds of trees in the forests west of the Dnieper are the oak, linden, and poplar. In consequence of the scarcity of timber, the houses are built of clay, and roofed with rushes. Cattle-breeding is carried on upon an extended scale, for the steppes are one vast expanse of pasture-ground. The stock of horses, horned cattle, goats, and swine is immense; and numerous flocks of sheep are also kept, the breed of which has been so much ameliorated that 316,335 pure Merinos alone were in stock in the year 1832: all these animals are left to graze in the open fields throughout nearly the whole twelve months. There were, in 1832, between 1450 and 1570 establishments for breeding oxen and cows, and 222 for rearing horses. Cheese and butter are made of sheep's milk. In the same year Ekaterinoslaf possessed 56,160 hives, from which much honey and wax were obtained. The culture of the silkworm is a favourite pursuit with the Greeks at Mariupol and the Armenians at Nakitchevan, and this branch of industry is rapidly on the increase. The chase forms a means of livelihood, as wild animals and game are plentiful: under this head we may enumerate the polecat, wolf, fox, buffalo, antelope goat (saiga), wild cat, tiger-marten, musk rat, pelican, wild duck, and partridge. The fisheries on the Dnieper, Don, Kalmius, and Sea of Azof are very productive, and are estimated to bring in upwards of 20,000*l.* per annum. Among the mineral products of the province, which are few and not of much importance, are lake salt, of which little advantage is taken on account of the scarcity of fuel, granite, chalk in large quantity, clay, and bog iron. The garnet is occasionally met with.

The population is a mixed race, principally of colonists who have gradually transformed a wilderness into a habitable and productive region during the last eighty or ninety years; they are composed of Great and Little Russians, Cossacks, Servians (who migrated hither between the years 1754 and 1760, by thousands at a time,) Walachians, Magyars, Silesians, Greeks, Armenians, Tartars, Germans, and Europeans in general. Of Greeks and Armenians, the numbers are about 30,000 of each; the Germans amount to about 10,000. The inhabitants are classed as follows in the returns for the year 1830:—

Hereditary nobles	2363
Superior officers and servants of the crown	2363
Clergy (including six monks)	4427
Soldiers on furlough and their families	3108
Merchants and dealers, mechanics, &c.	9344
Free peasantry and others attached to the crown lands	293,777
Peasantry belonging to crown donations	1988
Peasantry and others the property of individuals	226,684
Total	546,616

Arsenief considers this return as much below the real number, and estimates the population at 810,000 for the year in question; but Schubert, in his recent statistics of the Russian empire, states it to have been 828,100 even so far back as the year 1829. Hörschelmann, in his new edition of Professor Stein's 'Geography and Statistics,' states it to be 880,000. The numbers given by the two last writers appear to justify Hassel's estimate for 1820, of 757,530. All but the Cossack part of the population, which is semi-nomadic, have fixed abodes. We have no official account of their increase or decrease excepting for the year 1832, when the births amounted to 40,015, and the deaths to 27,851, showing an increase of 12,164 in that year (Schnitzler). The religion of the majority is Russo-Greek: the province contains 630 parishes, and the ecclesiastical head is the archbishop of Ekaterinoslaf, Cherson, and Tauris. The 30,000 original Greeks have a bishop of their own at Mariupol; and the Armenians are under the bishop of Nakhitchevan. There are a few Mohammedans and Jews.

Ekaterinoslaf is divided into the seven circles of Ekaterinoslaf, on the west side of the Dnieper; Verchne-Dnieprofsk, north of Ekaterinoslaf, also on the west side of the Dnieper; Novo-Moskofsk, on the east side of the Dnieper; Alexandrofsk, on the east side of the Dnieper, which separates it from Ekaterinoslaf; Paulograd, north-east of Ekaterinoslaf; Bakmut, east of Ekaterinoslaf; and Slavenoserbsk, the north-easternmost circle of the province, independently of the isolated district of Rostof, on the Sea of Azof. The principal towns are Ekaterinoslaf; Alexandrofsk, on the left bank of the Dnieper (about 3000 inhabitants); Novo-Moskofsk, on the Samara (3000); Paulograd, on the Voltshia, east of Ekaterinoslaf (900); Verkhnedneprofsk, on the right bank of the Dnieper, (about 250 houses); Bakmut, on the Bakmuta, (about 4300 inhabitants); Slavenoserbsk, on a tributary of the Donetz; and Taganrog, on the Sea of Azof (about 14,000). Besides these towns, which are the capitals of the seven circles, there are several others, the most important of which are Azof, on the sea of that name; Mariupol, at the efflux of the Kalmius into the Sea of Azof, with about 3300 inhabitants; Nakitchevan, on the Don (about 7200); and St. Dimitria Rostofskoye, a fortress at the confluence of the Temernik and Don (about 2500).

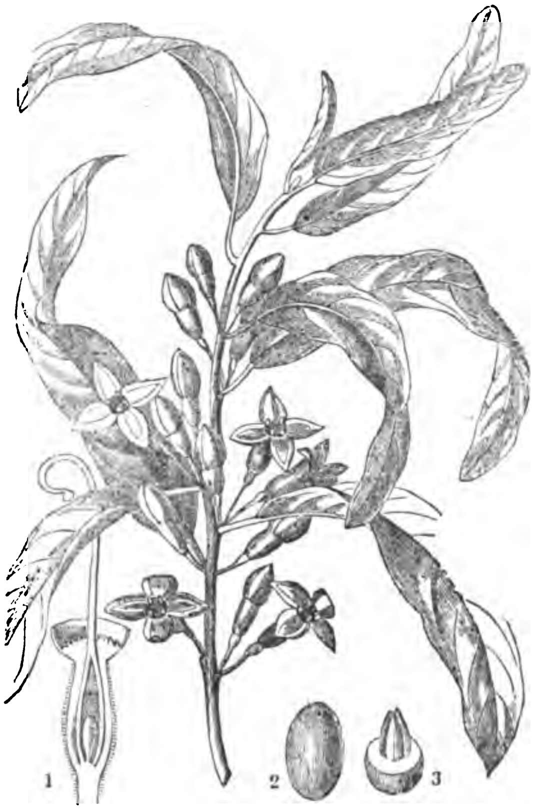
The manufactures of Ekaterinoslaf, although gradually extending, are not yet of much importance; in fact, there is still need for a much greater number of hands for the cultivation of the soil. The returns of 1830 show that in the 30 larger manufacturing establishments there were not more than 638 hands employed: these establishments consisted of 3 manufactories of woollen cloths, 6 of tallow and 7 of candles, 10 tanneries, 1 bell foundry, 3 breweries, &c. There were at that time not less than 225 brandy distilleries. The district of Rostof however is not comprised in this enumeration; and here there were 49 manufactories in the year 1832. The principal articles exported are fish, tallow, and other animal products.

The revenue collected by the crown in 1826 amounted to 7,439,794 paper rubles, or about 340,990*l.* sterling. About fifteen years before it was not more than 1,540,000 rubles, or about 70,590*l.*

The province of Ekaterinoslaf was first constituted by the empress Catherine in the year 1784, and was composed of the districts lying next the southern banks of the Dnieper, which were before this held by the Cossacks, of several large districts wrested from the Turks, and of Crimean Tartary as far as the shores of the Sea of Azof. In 1797 the emperor Paul augmented it by the addition of other lands between the Bog and Dniester, which had been ceded by Turkey, and the peninsula of Tauria; and he designated the whole of this extensive country New Russia. In the year 1822, however, the emperor Alexander, his son and successor, reorganised these possessions, and forming them into the governor-generalship of New Russia, divided it into the three provinces of Ekaterinoslaf, Cherson, or Nikolaieff, and Simferopol, or Tauris.

EKATARINOSLAF, the capital of the province, is situated on the right bank of the Dnieper, at the junction of the Kaidak with that river, in 48° 27′ N. lat. and 35° 2′ E. long. The first stone was laid by the empress Catherine II. in 1787. The town is close to the foot of a mountain, and is built according to an extended and regular plan adapted for a much greater number of inhabitants than the 12,000 which it at present contains. In 1833 they amounted to 11,548. The streets are broad, and laid out in straight lines, but in an unfinished state. There are three churches, a gymnasium, and an ecclesiastical seminary, an imperial manufacture of woollens, and several hospitals. Silk stockings are made, and some retail trade is carried on. The houses are about 900 in number. The navigation of the Dnieper terminates at Ekaterinoslaf, in consequence of the 'porogi,' or falls, which obstruct its navigation at Kaidak just below it. Prince Potemkin has some gardens and grounds in the vicinity.

ELÆAGNA'CEÆ, a small natural order of Apetalous Exogens, consisting of trees or shrubs, whose leaves are either opposite or alternate, destitute of stipules, and always protected more or less by scurfy scales, which usually give the plants a leprous aspect. The genera of this order have a tubular 4-lobed calyx, the inside of which is lined with a fleshy disk, that sometimes almost closes up the tube; there are three, four, or eight stamens, and a superior ovary, containing a single erect ovule. The fruit is soft, succulent, and would be eatable if it were not for its dryness and insipidity. In a few cases, when it is more than usually juicy and acidulated, it is actually considered an excellent fruit. Elæagnus hortensis and Orientalis bear a brown fruit, about the size of an olive, which is brought to market in Persia under the name of Zinzeyd: in quality it is like a jujube. The red drupes of Elæagnus conferta, the large olive-shaped ones of E. arborea, and the pale orange-coloured ones of E. triflora, are in like manner eaten in India; another occurs among the drawings of Chinese fruits. It is not a little curious, nearly as Elæagnaceæ are related to Thymeleaceæ, that they do not seem to participate in any degree in the acidity of that deleterious order. The only species found wild in Great Britain is the Hippophae rhamnoides, a spiny shrub, with diœcious flowers, small round orange-coloured acid berries, and narrow leaves, like those of rosemary, found growing on cliffs near the sea; its fruit, when the acidity is sufficiently covered by sugar, becomes a rather pleasant preserve. Elæagnus angustifolia, called in the gardens the *Olivier de Bohème*, a native of the eastern parts of Europe, is one of the most fragrant of all plants; its dull yellow flowers, hardly remarked among the leaves, fill the atmosphere with a delicious perfume, the source of which is not readily discovered by the passer by.



Elæagnus angustifolia.

1, a section of the tube of the calyx, showing the fleshy disk almost closing up the tube, the carpel, with its style and stigma, and the erect solitary ovule; 2, a ripe fruit; 3, the same cut away to show the single furrowed seed.

ELÆIS, a genus of palms, so named from elaia, the olive-tree, because an oil is yielded by the fruit of its principal if not only species. This is Elæis Guineensis, or oil-palm, *maba* of the natives of the Congo, and common all along the western coast of Africa. The tree is monœcious, as we are informed that both male and female spadices were obtained from a single plant cut down by Professor Smith. (Brown, in Tuckey's *Congo*). The stem is tall, about ten inches in diameter, rough, and bristling with the persistent bases of the petioles, of which the margins, as in recent leaves, are fringed with spines. The leaves are pinnate, about 15 feet in length, with two rows of sword-shaped leaflets, each 1¼ foot long. The fruit is ovoid, about the size of a pigeon's egg, with its outer fleshy covering of a golden yellow colour, and like that of the section Cocoinæ, to which it belongs, and analogous to the cocoa-nut, the foramina of its putamen at the apex, and not at base, as represented by Gærtner and others.

Mr. Brown has observed it as remarkable that Cocos I-dica and this palm, which is universally, and he justly, considered as having been imported into the W India colonies from the west coast of Africa, should be only two species of an extensive and very natural se of palms that are not confined to America. The *elæis* *dentalis* of Swartz, the *thatch*-tree of Brown's 'Jama and the *avoira* of Aublet, are probably all identical w the *maba*, or oil-palm, of the African coast.

The oil is obtained by bruising the fleshy part of the fr (and not the kernel, as sometimes stated), and subje the bruised paste to boiling water in wooden mortars; oil of an orange-yellow colour separates, which conc when cool to the consistence of butter, and has when f the smell of violets or of the root of the Florentine with a very slightly sweetish taste. This oil is used by Africans in cookery and for anointing the body. It fo a considerable article of commerce to Europe, where chiefly employed in perfumery and medicine. *Cocos* *racea* (which is referred by Kunth to the genus ela considered by the Edinburgh College to be the plant wh yields palm-oil.

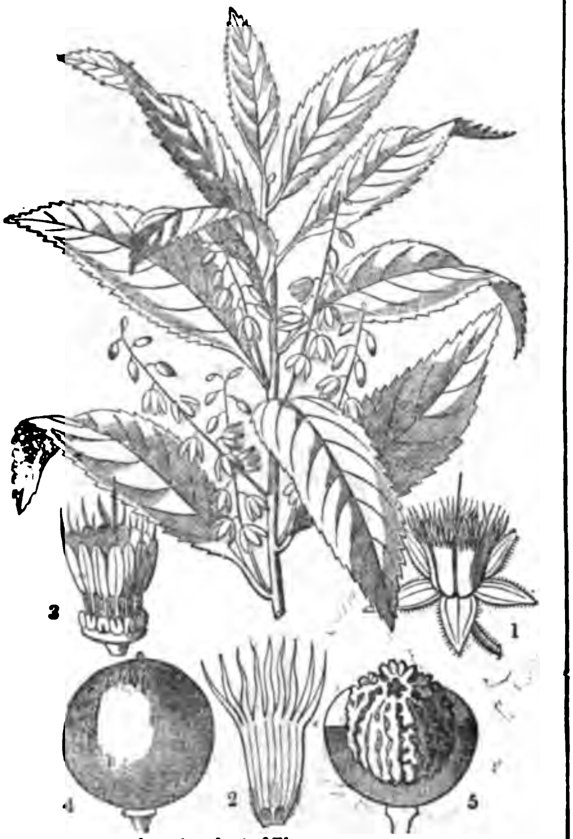
Reference has been made from **Alfonsia** to this art in consequence of Mr. Brown (Tuckey's *Congo*, App p. 456) having stated, 'It is probable that *alfonsia ole* of Humboldt, Bonpland, and Kunth belongs to elæis, a possibly may not even differ from the African species. this the above authors, in the 'Synopsis Plant. Æqui reply, that in elæis, according to the description of Jac both the floral envelopes are sexifid, while in alfonsia th are trifid. If this, moreover, be the same as the *coroz* Jacquin, 'another essential difference may be observed the structure of the fruit of the two plants, the nut in el being perforated at the apex, while the corozo has it perforated with three foramina at its base;' but this m have been inverted, as that of elæis was by Gær Humboldt and Bonpland, moreover, found *alfonsia ole* always growing wild, while *elæis guineensis*, as they is never found except in a cultivated state out of Af These two palms require to be carefully re-examine compared, to ascertain whether, if they are dist

Alfonsia oleifera.

species, as is probable from the figure of the former by Martius, they may not both belong to the same genus. The compressed nut of the alfonsia, like that of the cocoa-nut, is described as yielding an oil, which is obtained by boiling in water the *manteca del corozo ;* it is described as a liquid fat employed for ordinary lamps, as well as those of churches.

ELÆOCARPA'CEÆ, a natural order of chiefly Indian trees, having a strong botanical resemblance to our European Lindens, but differing in having fringed petals, and anthers opening by two pores at the apex. The species have not yet received sufficient attention from botanists, especially the few known in South America; and it is doubtful whether this order will not be eventually combined with Tiliaceæ.

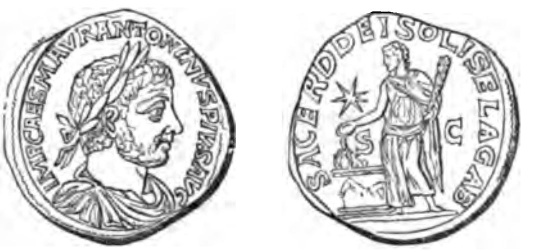
In the Indian genera the nuts, cleared of the soft pulp or flesh that covers them, are curiously sculptured, and being bony, and taking a fine polish, they are frequently set in gold and strung into necklaces. The nuts of Ganitrus sphæricus, a middle-sized tree, common in various parts of India, as well as the Malay Archipelago, and those of Monocera tuberculata, from the forests of Travancore, are what are principally used for this purpose. The fruits of Elæocarpus serratus, which are very much like olives when ripe, are said by Roxburgh to be pickled or dried and used in their curries by the natives of India. Elæocarpus cyaneus has pure white beautifully fringed petals, and is one of the most ornamental plants of New Holland.



A flowering shoot of Elæocarpus cyaneus.

1. a magnified flower ; 2, a petal ; 3, the stamens ; 4, a ripe fruit, 5, the same cut away to show the wrinkled seed.

ELAGABA'LUS, called also **HELIOGABA'LUS**, was the grandson of Mæsa, sister to the empress Julia, the wife of Septimius Severus. Mæsa had two daughters, Sæmis, or Semiamira, the mother of Varius Avitus Bassianus, afterwards called Elagabalus, who was reported to be the illegitimate son of Caracalla and Mammæa, mother of Alexander Severus. Elagabalus was born at Antioch A.D. 204. Mæsa took care of his infancy and placed him, when five years of age, in the temple of the Sun at Emesa to be educated by the priests; and through her influence he was made, while yet a boy, high priest of the Sun. That divinity was called in Syria Elagabal, which name the boy assumed. After the death of Caracalla and the elevation of Macrinus, the latter having incurred by his severity the dislike of the soldiers, Mæsa availed herself of this feeling to induce the officers to rise in favour of her grandson, whom she presented to them as the son of the murdered Caracalla. Elagabalus, who was then in his fifteenth year, was proclaimed emperor by the legion stationed at Emesa. Having put himself at their head he was attacked by Macrinus, who at first had the advantage, but he and his mother Soæmis with great spirit brought the soldiers again to the charge, and defeated Macrinus, who was overtaken in his flight and put to death A.D. 218. Elagabalus having entered Antioch, wrote a letter to the senate professing to take for his model Marcus Aurelius Antoninus, a name revered at Rome; Elagabalus also assumed that emperor's name. The senate acknowledged him, and he set off for Rome, but tarried several months on his way amidst festivals and amusements, and at last stopped at Nicomedia for the winter. In the following year he arrived at Rome, and began a career of debauchery, extravagance, and cruelty, which lasted the remaining three years of his reign, and the disgusting details of which are given by Lampridius, Herodianus, and Dion. Some critics have imagined, especially from the shortness of his reign, that there must be some exaggeration in these accounts, for he could hardly have done in so short a time all the mischief that is attributed to him. That he was extremely dissolute and totally incapable is certain; and this is not to be wondered at, from his previous eastern education, his extreme youth, the corrupt example of his mother, his sudden elevation, and the general profligacy of the times. He surrounded himself with gladiators, actors, and other base favourites, who made an unworthy use of their influence. He married several wives, among others a vestal. The imperial palace became a scene of debauch and open prostitution. Elagabalus being attached to the superstitions of the East, raised a temple on the Palatine hill to the Syrian god whose name he bore, and plundered the temples of the Roman gods to enrich his own. He put to death many senators; he established a senate of women, under the presidency of his mother Soæmis, which body decided all questions relative to female dresses, visits, precedence, amusements, &c. He wore his pontifical vest as high priest of the Sun, with a rich tiara on his head. His grandmother Mæsa, seeing his folly, thought of conciliating the Romans by associating with him as Cæsar his younger cousin, Alexander Severus, who soon became a favourite with the people. Elagabalus, who had consented to the association, became afterwards jealous of his cousin, and wished to deprive him of his honours, but he could not obtain the consent of the senate. His next measure was to spread the report of Alexander's death, which produced an insurrection among the prætorians, and Elagabalus having repaired to their camp to quell the mutiny, was murdered together with his mother and favourites, and his body was thrown into the Tiber, March, 222. He was succeeded by Alexander Severus. [SEVERUS.] The coins of Elagabalus bear the names of Marcus Aurelius Antoninus, like those of Caracalla, with which they are often confounded. The names of Varius Avitus Bassianus, which he also bore before his elevation to the throne, are not found on his medals.



Coin of Elagabalus.

British Museum. Actual Size. Copper. Weight, 280 grains.

ELAIDINE, a fatty substance produced by the action of nitrous acid upon certain oils, as olive and almond oil, &c. This substance is white, inodorous, insoluble in water, and fusible at 95° Fahr. It is soluble in sulphuric æther, and in 200 times its weight of boiling alcohol; when treated with potash it saponifies, giving rise to glycerin, and a peculiar acid which has been called elaïdic acid. This acid is solid, fusible at 112° Fahr., and is partially distilled by exposure to a strong heat.

ELAIN. [OLEIN.]

He took the name of Varius from Sextus Varius Marcellus, who was his mother's husband.

ELAM. [Elymais.]

ELAPS. [Viperidæ.]

ELASMOTHE'RIUM. [Pachydermata.]

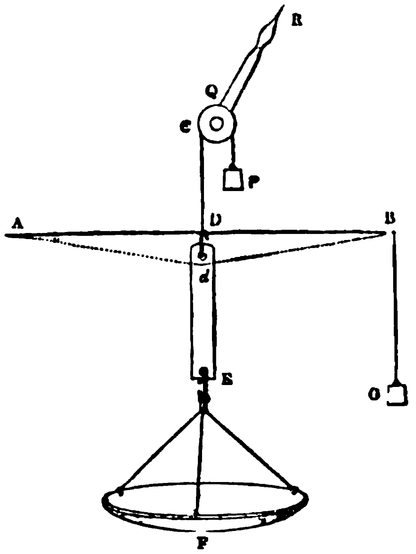
ELASTICITY (ἐλαστὴς, a spring). When the form of a body is affected by the pressure of another extraneous to it, the re-acting force by which it sustains or tends to remove that pressure is its elasticity. The term has been very loosely used in the most current works, which, instead of furnishing an exact and general idea of this force, are, in general, limited to the phenomena exhibited by elastic solid bodies; and to this imperfect notion of elastic force we are to attribute the discrepancies of treatises, some of which used to represent water as perfectly inelastic, some (as the more modern treatises) as perfectly elastic. The cause of elasticity then belongs to the theory of molecularity, its effects in aggregate masses to mechanics.

The equilibrium of the molecules of solid bodies is almost completely dependent on their own mutual actions and quantity of heat. These forces determine certain mean places for the constituent particles, to which points of stable equilibrium they tend to return when removed a little from them by an external force. This removal may be such as to effect in the mass either compression or extension, inflexion or torsion, and therefore their elastic force is capable of being exhibited in all these ways. It is demonstrated in fluids only by their compressibility, while in gases it arises as a predominant living force which would refuse any position of equilibrium to the constituent particles without external pressure, and is proportional to such pressure uniformly exercised.

When heat is applied to a solid elastic body, that is, when its temperature is raised, the particles seek a different position of equilibrium more remote from each other than before. But while this heat is much below that necessary for friction, or for destroying the fibrous formation of organized matter, the stability of the removable particles is but little affected, and experiment shows that there is scarcely any change of elasticity. In fluids the compressibility obtains a greater range, while in gases, where no countervailing force of attraction is sensible, the increase of temperature is accompanied by a proportional increase of elastic force.

Amongst bodies whose elasticity is very apparent, we may enumerate glass, ivory, caoutchouc, sponges, and fibrous substances, as beams, muscles, and artificial webs, some gums, steel, and all the gases and vapours. In gases and vapours its effects may be produced to any extent, but they are limited in solids by their softness and facility of fusion, as in wax, lead, &c.; by their absorption of moisture, as in clay, feathers, catgut, straw; or by their friability, as in glass, dry resins, and copper or iron which have been exposed to a stream of ammoniacal gas.

Suppose an elastic string, or lamina, to be fixed at one end, and at the other stretched by a force T, which will also represent its tension; if this force be increased by a small quantity *t*, an additional length *l* would be given to the string, or lamina; the whole tension now is T + *t*, and if we again add a force *t*, since the physical condition of the body is sensibly the same as before, the same length *l* will again be added, and generally the additional extension should be proportional to the additional tension: this law is, however, only approximative, for it is manifest that a force tending to produce either extension or contraction may be applied which would cause the body to break, and near these limits the law would vary considerably from simple proportionality. Let a horizontal elastic lamina AB be fixed by a screw at A, and having been stretched by a known weight G at B, let it be screwed also at that point, when its tension will evidently be equal to the weight appended; let the beam DE of a balance F be sustained at D, the middle of AB through a drilled orifice *d*, and be attached to a string passing over the fixed pulley C, which string also sustains a weight P, which is an exact counterpoise to the weight of the scale and beam so that they may produce no deflection of themselves in AB; then if a small weight be put into the scale, the lamina ADB will be bent into the form A*d*B, with a deflection D*d* from its original position, which may be estimated with greater accuracy by a hand QR attached to the pulley. An extension A*d*B − ADB will thus be produced, as well as an increase of tension, which may then be compared by the common laws of statics; and the experiments show that as long as the added weights are small, this extension is proportional to the increase of tension. The apparatus is that employed by S'gravesande.



When a uniform elastic string is suspended vertically it will be stretched by its own weight. The tension varies from point to point, and is every where proportional to the portion of the string of which it supports the weight. If *y* be a portion of the stretched string corresponding to a portion *x* of the same unstretched, and $y + \Delta y$, $x + \Delta x$, another corresponding pair of portions greater than the former, and *a* the whole length of the string in its natural state, the extension $\Delta y - \Delta x$ of the element Δx is proportional to the weight of the remaining portion $a - x - \Delta x$ of the string; hence if *g* denote the weight of a unit of the string, and *e* the index of elasticity peculiar to the substance, we have ultimately [Differential Calculus] $\frac{dy}{dx} - 1 = ge(a-x)$, and therefore by the rules of the *Integral Calculus* $y - x = ge\left(ax - \frac{x^2}{2}\right)$, to which no arbitrary constant need be added, because *y* commences at the same point with *x*: if we now make $x = a$, we find that $g\frac{e}{2}.a^2$ expresses the extension of the entire string.

Similar principles may be easily applied to determine the form of an elastic string suspended from two points and stretched by its own weight; but in this case the curve which differs from the common catenary cannot be considered as accurately determined without taking into account the elasticity of inflexion as well as that of extension. The mere mathematical problem may be seen in mechanical treatises. (Whewell's *Mechanics*; Poisson, *Mécanique*; consult also Lagrange, *Mec. Analytique*, for the m of introducing the condition of elasticity in a system at

An important practical branch of this subject, on the strength of beams, which has been much advanced by Peter Barlow, and the more recent experiments of Eaton Hodgkinson, of Manchester, we reserve for a article. [Strength of Beams.]

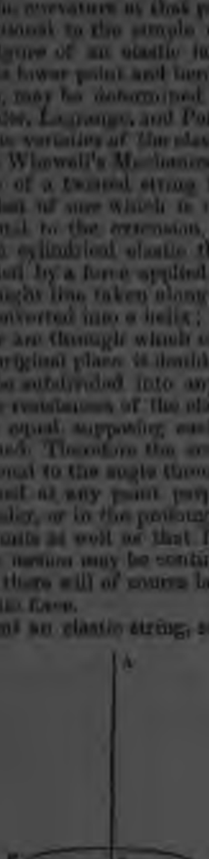
When a uniform elastic string, fixed at one extremity and stretched by a force applied at the other extremity, be abandoned to itself, it will return to its original form by a series of contractions and expansions, the force which solicits each point being proportional to its distance from its original place, though the successive oscillations go on rapidly diminishing in extent in consequence of the resistances encountered. The same law applies to the displacements of the molecules of elastic fluids and gases.

For the laws of the mutual impact of elastic bodies, see Impact. If a body is attached to an elastic string, which at the other extremity is fixed, and be projected in any direction, the resolved part of the centrifugal force which acts in the direction of the length of the string tends to stretch it, and the centripetal force will be proportional to *r* — *c*, *r* being the length of the stretched and *c* of the unstretched string: this force is attractive when *r* is greater than *c*, and repulsive when less. Hence if we conceive circle, of which the centre is the fixed point, and the radius equal to c; the portions of the orbit described externally to the circle are concave, and those internally are convex towards the centre of the circle, and there are as many points of contrary flexure [CURVE] as intersections of the trajectory and circle. Neither the law of the periodic times nor the form of the orbit is similar to those belonging to the earth and planets: the supposition, therefore, that attraction between the great masses which compose the solar system is conducted through the medium of interposed and invisible elastic strings is unfounded.

When an elastic string, fixed at one end, is bent by a weight or other force applied at a given point, the elasticity of inflexion acts normally at each point of the curve, and is some function of the curvature at that point. It is usual to suppose it proportional to the simple curvature. On this supposition the figure of an elastic lamina in a vertical position, fixed at its lower point and bent by a small weight applied at the top, may be determined. This problem has been treated by Euler, Lagrange, and Poisson. The English reader may find the varieties of the elastic curve discussed in the appendix to Whewell's Mechanics.

The elastic force of a twisted string follows a law precisely similar to that of one which is only stretched; the latter is proportional to the extension, the former to the torsion. Thus, if a cylindrical elastic thread, fixed at one extremity, be twisted by a force applied perpendicularly to its length, any straight line taken along the surface of the cylinder will be converted into a helix; and with a double torsion the circular arc through which each point has been removed from its original place is doubled. And since the circular arc may be subdivided into any number of equal arcs, the successive resistances of the elasticity to the additional torsions are equal, supposing each preceding resistance to be sustained. Therefore the accumulated force of torsion is proportional to the angle through which an index would move if fixed at any point perpendicularly to the length of the cylinder, or in the prolongation of its radius; but this law has limits as well as that for the elasticity of extension; for the torsion may be continued until a strain is produced, when there will of course be an accompanying diminution of elastic force.

Let A B represent an elastic string, suspended vertically from the point A, and attached at B to a cylindrical body D E, of which the axis B C is in the direction of the string produced, the string being primitively in an untwisted state. Let the cylinder be turned round its axis through an angle F B G, or a, which measures the torsion generated in A B, and also the elastic force tending to bring the system back to its original state. Let the restraining force be now removed, and the cylinder, abandoned to itself, will return to its original place after a series of isochronous oscillations, which are gradually diminished by the resistance of the air and by the internal resistances of the molecules of A B during the process of being twisted and untwisted.



Let δm stand for an element of the cylinder, situated at a distance r from its axis, and θ the angle of torsion, at any time after the commencement of this motion; then $-\frac{d\theta}{dt}$ is the angular velocity; and therefore the linear velocity of δm is $-r\frac{d\theta}{dt}$; the accelerating force in ratio of the increments of velocity and time is $-r\frac{d^2\theta}{dt^2}$; the force of torsion being proportional to the angle θ, may be represented by nθ applied at a distance unity from the axis of the cylinder, perpendicularly to the radius, the constant n being the force of torsion corresponding to an angle unity. Now, by D'Alembert's principle, the impressed forces taken in a reversed direction, would make equilibrium with all the effective forces: that is, the force $-n\theta$, at a distance unity, would produce an equilibrium with the forces such as $-r\,\delta m\frac{d^2\theta}{dt^2}$ acting on δm at a distance r; hence the corresponding moments, which are $-n\theta\times 1$, and the sum of all such as $-r^2\delta m\frac{d^2\theta}{dt^2}$, must be equal, but of contrary signs; and since $\frac{d^2\theta}{dt^2}$ is the common accelerating force on all the particles δm at a unit distance, we need only take the sum of the products $r^2\delta m$, which is easily found in this case by the rules of the integral calculus, and is called the moment of inertia of the cylinder. Representing it by M K², where M is the mass of the cylinder and K its radius of gyration, we have the equation—

$$M K^2\frac{d^2\theta}{dt^2}=-n\theta.$$

Put for abridgment $c^2=\frac{n}{M K^2}$; then, by the methods for integrating differential equations, we find $\theta=A\sin(ct+B)$, where A B are arbitrary constants; and for the velocity $\frac{d\theta}{dt}=A\,c\cos(ct+B)$.

Now, we can determine the constants by the circumstances of the origin of the motion; for when $t=0$, we have supposed the initial torsion was a, or F B G, and $\frac{d\theta}{dt}$ was then nothing. Hence we have $a=A\sin B$; $0=A\cos B$; therefore $A^2=a^2$, $B=\frac{\pi}{2}$. The value of θ is therefore expressed at any time by $a\cos(ct)$.

When the cylinder makes half an oscillation the elastic thread is then perfectly free from torsion; and if T be the time of an entire oscillation, since θ then vanishes, we find $0=a\cos\left(\frac{cT}{2}\right)$; therefore $cT=\pi$, and $T=\frac{\pi}{c}$, which shows that the successive oscillations are of the same duration, and that the square of the time of one oscillation varies directly as the moment of inertia, and inversely as the force of torsion, estimated at a given distance from the string.

The suspended body may be any other as well as the cylinder we have supposed, with manifestly the same results. For instance, in Coulomb's torsion balance it consists of a needle of gum-lac attached perpendicularly to the string, as B F in the above figure, and a small weight at B to steady the string; the law of the times of oscillation above found is sufficient to give the force of torsion in all cases if we know it in one. It is thus that Coulomb used his balance in finding the law of electrical attractions and repulsions; the electrified ball acted on, being attached to the end of the needle of gum-lac, was subjected to the joint action of electrical and elastic forces. [ELECTRICITY.]

The range of the elastic force of fluids, in consequence of their great resistance to compression, is extremely limited, and therefore few ordinary phenomena of nature are dependent on this cause. The great pressure at considerable depths in the ocean must produce a corresponding increase of density in the lower strata, if it is not in a great measure compensated by the increase of temperature.

There exists one simple and uniform law for the elastic forces of dry air and all the gases. From the experiments of Boyle, Mariotte, and Dalton, it is established, that the elasticity, which is proportional to the pressure, is inversely as the volume, and therefore directly as the density, when the temperature is constant.

But an increase of temperature produces an increase of the elastic force of gases; or, which is the same under a given pressure it expands the gas into a greater volume. Between the temperature of melting ice and boiling water this increase of volume is proportional sensibly to the additional temperature, measured by a mercurial thermometer, as was well established by the experiments of Gay Lussac; but by the more recent experiments of MM. Dulong and Petit, it appears that at much higher temperatures the degrees of the mercurial and gas thermometers no longer correspond; for the expansions of the mercury might be expected to become irregular when it tends to gasefy, and therefore to have greater expansions for each degree of heat than in its liquid state. (*Annales de Chimie et de Physique.*)

In such experiments it is essential that the gas should be perfectly dry; for if not, the elastic force obtained will be that of dry air *plus* that of the contained aqueous vapours. For most observations on the latter we are indebted to the researches of Dalton, who observed that when the inside of a barometer is moistened, the elastic force of the vapours, occupying the space which is a vacuum in ordinary barometers, causes a depression in the column of mercury proportional to itself.

When a space is saturated with aqueous vapour or steam, the elasticity remains the same when the volume is diminished, the only effect of compression being to convert the surplus portion into water. The contrary holds generally in gases, as we have seen that their elasticity is inversely as their volume; but it is probable that with very high pressures, such as that employed by Mr. Faraday to liquefy carbonic acid gas, there exists a limit for each, beyond which it is impossible to render them more elastic by compression.

Moreover, the ratio of the elastic force of dry gas at the temperature of boiling water to that at the freezing point is by no means the same as in aqueous vapours; but at very high temperatures it seems probable that similar ratios would approximate. The following is a table of the elastic forces of the latter, corresponding to degrees of the centigrade thermometer:—

Temperatures.	Elastic Force in inches.	Successive Ratios.
0	0·2	.....
6¼	0·297	1·485
12½	0·435	1·465
18¾	0·63	1·448
25	0·91	1·444
31¼	1·29	1·418
37½	1·82	1·411
43¾	2·54	1·395
50	3·5	1·378
56¼	4·76	1·36
62½	6·45	1·355
68¾	8·55	1·326
75	11.25	1·316
81¼	14·6	1·298
87½	18·8	1·288
93¾	24	1·277
100	30	1·25

The third column is given incorrectly in Biot's 'Physique;' and it follows from inspection that the elastic force of steam increases nearly in a geometrical progression when the temperature is increased in arithmetical; from which property steam has now become a great mechanical agent.

When vapours are mixed with each other at the same temperature and in the same space, the elastic force of the compound is the sum of the separate elasticities, provided this sum is not sufficiently great to render any of the vapours liquid, and provided these vapours have no chemical affinity.

The vibrations of elastic bodies belong to the subject of acoustics, to which we refer, and to the head VIBRATION. Beside the authorities already quoted in this article, see Pouillet, 'Physique,' and 'Manchester Transactions.'

ELATÆA. [PHOCIS.]

ELATE'RIDÆ, a family of Coleopterous insects belonging to the section Sternoxi (*Latreille*), and, according to Linnæus, constituting the genus Elater.

The insects of this family are of a lengthened form; the head is, in nearly all cases, deeply inserted into the thorax: the thorax is usually of the same width as the elytra, or nearly so, longer than broad, and the posterior angles are acute, and most frequently produced into a pointed spine-like process: the elytra are long and narrow, cover the abdomen, and their external margins are often nearly parallel. The antennæ are of moderate length, either filiform, serrated, or pectinated, and when the insect is at rest they are deposited in two grooves on the under side of the thorax; at least such is the case in very many of the species. The legs are short and rather slender, and the femora and tibiæ are generally compressed.

These beetles are found upon flowers and upon the leaves of trees and plants; some species however are most frequently met with upon the ground. When upon any elevated situation, if approached, they apply the legs and antennæ close to the body, and allow themselves to fall to the ground; if they fall upon their back they regain their natural position by a leap, which is always accompanied by a snapping noise similar to that which may be made by the finger-nails. When about to leap, they bend the thorax backwards, so that the body is arched, or rather forms an angle, the insect then resting upon the apex of the abdomen and the fore part of the thorax. The leap appears to be effected by the sudden relaxation of the muscular effort which kept the thorax bent backwards, there being a peculiarity in its structure which causes it to spring forwards.

Even in a dried specimen, upon attempting to bend the thorax back, we found considerable resistance; but when allowed, it suddenly assumed its natural position, which is a slight inclination forwards.

There is a strong spine, it must be observed, on the under part of the thorax, at its base, which, when the thorax is in its usual position, is deposited in a groove; and it is said that the leap is performed principally by means of this spine, which is at the time forcibly pressed against the margin of the hollow 'into which it sinks suddenly, as if by a spring.' From this opinion we are inclined to differ; for upon removing the spine we found not the slightest alteration in that natural spring in the thorax which we before mentioned. Not however having at this moment the means of investigating the subject, it would be premature to venture any further remarks.

The larvæ of the Elateridæ feed most generally upon vegetable substances: rotten wood affords food to many, others live in the ground, and feed upon *the roots of plants*: one of them (the larva of Elater striatus of Fabricius) is said to attack the roots of the wheat, and when in great numbers, to do much injury*.

These larvæ are long, rather slender, generally cylindrical, and covered with a tough skin: the head and terminal joint of the body are of a corneous texture; the latter is very variable in form, and is often depressed and produced into two bluntly-pointed processes: the former is furnished with the usual parts, such as jaws or mandibles, maxillæ, palpi, labrum, labium, and antennæ. The three segments which constitute the thorax are each furnished with a pair of short legs.

Of the insects included by Linnæus under the generic name of Elater, and others of similar general characters, which have been discovered since that naturalist's time, there are upwards of five hundred species enumerated; but as these species (which are now regarded as constituting a family) are divided into about sixty genera, it will be impossible, consistent with the plan of this Cyclopædia, to enter into the detail of their characters. We will therefore confine ourselves to some of the more important;—in fact to those which are given by Latreille in the 'Règne Animal:' these are as follows:—*Galba, Eucnemis, Adelocera, Lissomus, Chelonarium, Throscus, Cerophytum, Cryptostoma, Nematodes, Hemeripus, Stenicera, Elater* (proper), and *Camphylus*. These genera are divided by Latreille into two sections, in the first of which the antennæ are lodged (when the insect is at rest) within two grooves situated on the under side of the thorax.

This section includes the six first genera. The genus *Galba* (Latreille) has the antennæ filiform, and received into two grooves situated directly under the lateral margins of the thorax: the joints of the tarsi are simple: the thorax is convex: the mandibles are terminated by a simple point: the maxillæ are furnished with a single small lobe: terminal joint of the palpi is globular, and the body nearly cylindrical.

The species are all from Brazil. The genus *Eucnemis* (Ahrens) differs from Galba chiefly, in having the mandibles bifid at the apex, the maxillæ terminated by two lobes, terminal joint of the palpi securiform, and the body more elliptical. Species of this genus are found in Europe and North America.

Genus *Adelocera* (Latreille). Here the antennæ are filiform; the joints of the tarsi are simple, and the anterior legs, when contracted, are received into lateral cavities in the under part of the thorax.

Lissomus (Dalman.) The species of this genus have little cushion-like lobes on the under side of each joint of the tarsi.

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* A larva of one of the Elateridæ (which there were good reasons for believing was that of Elater æneus) we have found more than once feeding on worms.

In the genus *Chelonarium* (Fabricius) the form approaches to an oval, the second and third joints of the antennæ are larger than the following and of a flattened form, and these antennæ are received into the sternal grooves. The head is almost hidden by the thorax, which is semicircular, and the anterior legs are larger than the rest. All the species are from South America.

Genus *Throscus* (Latreille). This genus is readily distinguished by the antennæ being terminated by a three-jointed knob; the penultimate joint of each tarsus is bilobed; the mandibles are simple.

The species of Throscus are very minute. *Throscus dermestoides*, an insect not uncommon in this country, is about one-eighth of an inch in length, of a brown colour, and obscurely covered with an ashy pubescence.

The second section of the Elateridæ comprises those species in which the antennæ are free, or not lodged within grooves on the under part of the thorax.

Cerophytum (Latreille). The principal characters of this genus are:—terminal joint of the palpi larger than the following, and almost securiform; tarsi with the four basal joints short and triangular, the penultimate joint bilobed; antennæ serrated in the female, and in the male branched internally.

The *Cerophytum Elateroides* (Latreille), an European species, affords an example of this genus.

Cryptostoma (Dejean). Tarsi simple, small, and slender; anterior extremity of the prosternum projecting beneath the head; the apex of the third and seven following joints of the antennæ prolonged; mandibles unidentate; maxillæ with a single lobe; palpi very short.

Cryptostoma denticornis (Lat.), the only species known, is from Cayenne.

Nematodes (Latreille). Body nearly linear; antennæ with the basal joint elongated; each of the five following joints in the form of a reversed cone; the remaining joints almost cylindrical, with the exception of the last, which is oval.

Species of this genus have been found in Europe and North America.

Hemirhipus (Latreille). In this genus the parts of the mouth are exposed, i.e., not as in the two last genera, hidden by the projecting process of the prosternum; the antennæ are flabellate at the apex in the males.

All the species of this genus are extra-European.

In the genus *Ctenicera* (Latreille) the antennæ are pectinated in the males, and deeply serrated in the females.

The *Ctenicera pectinicornis*, an insect common in some parts of this country, affords an example of this genus. This species is rather more than half an inch in length, and is of a brilliant metallic green or copper-like colour; the female is larger and broader than the male.

In the genus *Elater*, as now restricted, the antennæ are simply serrated.

The *Elater æneus* of Linnæus will serve to illustrate this genus. This species, which is common in some parts of England, is generally found under stones on hills of but little elevation, and which are more or less covered with heath. It is about three-quarters of an inch in length, and most commonly of a brilliant green colour; some specimens however are blue, and others are of a brassy or bronze hue.

The *Elater noctilucus*, according to Latreille, also belongs to this genus. This species is well known in South America, where it is called the fire-fly.* It is rather more than an inch in length, of a brown colour, and covered with an ashy down; on each side of the thorax there is a round glossy yellow spot. These spots emit by night a light so brilliant as to enable a person to read by it, and it is a common practice to place several of the insects together in a glass jar or bottle for this purpose. This insect (with upwards of twenty other species, all of which emit light by night) is now included in Illiger's genus *Pyrophorus*. The species of this genus are, some of them, from each of the following localities:—Brazil, Peru, Buenos Ayres, Chile, Cuba, St. Domingo, and Guiana.

In the genus *Campylus* (Fischer) the eyes are more prominent than in the other Elateridæ, and the head is protruded from the thorax; the antennæ are inserted beneath a frontal projection on each side; and the body is long and almost linear.

One species of this genus is found in England, the *Campylus dispar*, which is of a yellowish colour. In some specimens the head, legs, and antennæ are black, and sometimes the elytra are black with a broad pale margin.

ELATERIUM. [MOMORDICA.]

ELATMA, or YELATMA, the chief town of the most northerly circle in the Russian government of Tambof in Great Russia. It is situated at the confluence of the Mokcha and Oka, on the left bank of the latter, in 55° 5′ N. lat., and 42° 31′ E. long. Elatma is an old town, and contains ten churches, eight of wood and two of stone, several government buildings, about 600 houses and thirty-four wooden stores, and about 6000 inhabitants. It has manufactures of linens, vitriol, and sulphur, and a considerable trade in grain, hemp, wax, and honey, chiefly with Moscow, and the provinces on the banks of the Volga, to which parts the Oka gives the means of ready access. The extensive iron works of [illegible], which employ nearly a thousand hands, are in its immediate neighbourhood.

ELBA, the Ilva of the Romans, called Æthalia (Αἰθαλία) by Strabo, p. 223, is an island in the Mediterranean sea, near the coast of Tuscany, and divided from it by the channel of Piombino, which is about five miles broad in its narrowest part opposite the town of Piombino, which lies on the main land. The shape of Elba is very irregular; its length is about eighteen miles, from 10° 4′ to 10° 25′ E. long., and its greatest breadth, which is on its east side, is about ten miles, from Cape Calamita 42° 43′ to Cape Vito 42° 52′ N. lat.; but in its west part it is six miles broad, and towards the middle of its length it is only three, owing to the coast being indented by gulfs both from the north and south. Its area is about 154 square miles. The island is mountainous; the highest summit, Monte della Capanna, in its west part, is 3000 feet above the sea. The mountains are mostly naked, but the lower ridges and the valleys between are planted with the vine, olive, and mulberry, and other fruit trees. The island produces also some wheat and Indian corn, vegetables, and water melons. Wine, both white and red, is made in considerable quantities; some of it, especially the red sort, is very good, and forms an article of exportation. There is also a kind of muscadel, or dessert wine. Horned cattle and horses are rather scarce, but there are plenty of sheep, goats, pigs, and asses. Fish is plentiful on the coast, and the tunny fishery yields a considerable profit. The salt pans on the sea-shore produce about 40,000 cwts. of salt yearly. Elba is rich in iron, which is of the best quality, and was worked in the time of the Romans. It is found in a mountain, near Rio on the east coast, which is almost entirely a mass of ore, about two miles in circumference, and 500 feet in height. About 120 miners are employed in it, and the ore yields from 50 to 75 per cent. of pure metal. Owing to the scarcity of fuel the ore is embarked and taken to the mainland to be smelted, as it was when Strabo wrote. The annual quantity of metal raised is about 40,000 cwts. The other mineral productions of Elba are loadstone, alum, vitriol, and marble of various kinds. The population of Elba is about 13,500, of which Porto Ferrajo, the capital, has about 3000. Porto Ferrajo lies on the north coast of the island, and is strongly fortified with two citadels on the hill above it, and has an excellent harbour. The town has two parish churches, one hospital, and a lazzaretto. It is the residence of the cancelliere, or political governor for the whole island, which is included in the province of Pisa; it has a garrison and military commander, a civil and criminal court, from which appeals are laid before the ruota, or high court of Grosseto. From Porto Ferrajo a good road, five miles in length, made by Napoleon, leads to Porto Longone on the east coast of the island, on a deep bay, where there is good anchorage for vessels. The castle of Porto Longone is on a steep hill, and is regularly fortified. The town or village is small, and reckons about 1000 inhabitants. The other principal villages in the island are Rio, Marciana, Campo, and Capo Liveri. The island of Elba has acquired considerable celebrity in our times, on account of it having been the residence of Napoleon after his first abdication, from May, 1814, to the 26th of February, 1815, when he set sail for Cannes. From that time it has been annexed to the grand duchy of Tuscany. The mountains of Elba form a conspicuous object as seen from Leghorn, which is about fifty miles north of the nearest point of the island. (Neigebaur, *Gemälde Italiens;* Pini, *Osservazione sulle Miniera di Ferro dell' Isola dell' Elba.*)

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* Other insects having the same power of emitting a light by night are occasionally confounded with the present species under the name of fire-flies.

ELBE, The, one of the largest rivers in Europe, flows like the Weser entirely within Germany. It originates in the confluence of a number of rivulets and brooks which fall down the western side of the Schneekoppe, or Snowcap, one of the highest mountains in the Riesengebirge, or Giant mountains, of Bohemia, and in that part of them which separates Bohemia from Silesia. Some writers refer the source of this river to the Weissbach (Whitebrook), which springs from the White Meadow, at the foot of the Schneekoppe; others to the Elbe or Narvor Meadow, where eleven springs, called the Wells of the Elbe, are said to rise, and uniting in one stream, which takes the name of the Elbe or Mädelbrunn, fall over a lofty precipice into what is termed the Elbgrund, or region of the Elbe. Here the stream is increased by the Seifen and other rivulets which join it below Krausensbaude, whence it runs towards Hohenelbe under the universally admitted designation of the Elbe. From Hohenelbe, a mountain town in the north-eastern circle of Bidschow, in Bohemia, it flows south-east to Arnau, thence south-west into the circle of Königsgrätz, where it is joined by the Aupa near Yarowitz, the Metau at Josephstadt, and the Adler or Orlitz at Königsgrätz, and afterwards passes into the circle of Chrudim, whence, after receiving the Chrudimka at Pardubitz, it takes a westerly direction. Having passed Elbe-Teinitz, below which it is joined by the Dobrowa, and skirting the northern extremity of the circle of Czaslau, it traverses the most north-eastern part of that of Kaurzim, where it flows past Kolin, and there winding to the north-west re-enters the circle of Bidschow, and crosses its south-westerly districts past Podicbrad. It now pursues a course due west along the southern border of the circle of Bunzlau, re-enters that of Kaurzim, flows north-west from Taurzim past Brandeis, above which it receives the Iser and Elbe-Kostoletz, to Melnik, in the south-western extremity of the circle of Bunzlau, where it is increased by the waters of the Moldau, and from which place (in 50° 20′ N. lat. and 14° 28′ E. long.) it has an unobstructed navigation to its mouth. From Melnik it forms the boundary for a short distance between the circles of Rakonitz and Leitmeritz, then winds southwards to Kaunnitz, and after entering the last-mentioned circle by again flowing north-westwards from Kaunnitz, is joined by the Eger a few miles above the town of Leitmeritz. From this place it flows northwards to Aussig, takes a winding easterly course past Tetschen where it receives the Pulznitz, bends gradually north-westwards, quits Bohemia near Hernkretschen, or Hirniskretschen, and enters the kingdom of Saxony. At this point the Elbe is 355 feet in width. It thence takes a north-westerly course past Schandau, between which place and Dresden it passes through the Lusatian and Ohre Mountains of Saxony, then flows to Pirna, Dresden, Meissen, Riesa, and Strehla, and enters Prussian Saxony at Loesnitz, about seven miles above Mühlberg. Its whole length from the south-eastern to the northern frontiers of Saxony is between 70 and 75 miles. From Mühlberg its course is north-westerly to Torgau, and thence to Wittenberg, above which it receives the Black Elster; here it takes a westerly direction, leaves for a while the Prussian states, traverses the Duchy of Anhalt from Koswig past Dessau to Barby, during its passage through which it receives the Saale and Mulde, and thence turning northwards, re-enters those states above Aacken, receives the Ohre, and flows on to Magdeburg until it reaches the point below Sandow, where it is joined by the Havel. Here it again has a north-westerly direction, forming first the boundary between Brandenburg and Prussian Saxony till it passes Schneckendorf, and next for a short distance between Brandenburg and Hanover: thence it separates Hanover from Mecklenburg until it enters the north-eastern districts of that kingdom between Dömitz and Hitzacker. After traversing them as far as Boitzenburg, it divides the Hanoverian dominions from the duchies of Lauenburg and Holstein and the Hamburg territory, until it discharges itself into the North Sea. Altogether it traverses Hanover or forms its north-eastern boundary for about 120 miles. Below Winsen, which lies to the south-east of Harburg in Hanover, the Ilmenau falls into it, and below Neuhauss somewhat above Altona, but on the left bank like the former, the Oste. From Hamburg and Altona downwards to Glückstadt in Holstein and thence to the North Sea it becomes navigable for large ships. Its mouth lies north of Cuxhaven, about 85 miles below Hamburg.

The Elbe first flows through a deep narrow valley [illegible] Josephstadt, the right bank being much higher than [illegible] left. This valley widens gradually until the Elbe has passed Nimburg, between Kollin and Brandeis, where it again [illegible] comes contracted. From Nimburg to Raudnitz, south [illegible] Theresienstadt its banks are lower, but from the last two until it reaches Lowositz they are much more elevated, [illegible] thence as far as to Pirna in Saxony its bed lies in a [illegible] confined valley. From Pirna the heights on its left [illegible] subside, whilst those on its right accompany the Elbe [illegible] little distance until it has passed Dresden and Meissen. From thence to Torgau a succession of low hills run parallel to both banks, and there entirely disappear. A range [illegible] hills approaches the left bank at Dömitz, and occasional heights the right bank near Wittenberg. From the mouth of the Saale until a little above Magdeburg the banks [illegible] flat, but in this part high hills command them at several points. From Magdeburg the Elbe flows through a level country into the North Sea, except between Hitzacker [illegible] Bleckede on its left and about Altona on its right bank, where the adjacent ground rises to gentle elevations.

In the lower parts of its course, namely, between Harburg on its left bank, and Hamburg and Altona on its right, the Elbe is divided into several arms by five large and [illegible] small islands; these arms, however, unite again in [illegible] channel at Blankenese, about five miles below Hamburg.

The whole length of the Elbe is about 710 miles, and [illegible] is navigable for about 470 miles. Its mean depth is [illegible] feet and its average breadth 900 feet, but it widens [illegible] some points to 1000 feet and more, and near its mouth to several miles.

The height of this river above the level of the sea is as follows: near its source 4151 feet; at Königsgrätz 6[illegible]; [illegible] Melnik 426; at Schandau 320; at Pirna 287; at Dresden 262; at Wittenberg 204; at Magdeburg 128; at Tangermünde 87; at Losenrade 48; at Dömitz 26; at Hitzacker 19; at Bleckede 11, and at Boitzenburg 9 feet.

There are 35 bridges across the Elbe between its [illegible] and Torgau, below which town the communication between both banks is by ferries. The principal bridges are [illegible] at Leitmeritz, which is of wood and stone, and 82[illegible] feet [illegible] length; Brandeis; Dresden, of stone, 1420 feet long [illegible] 36 broad; Meissen; Torgau; Wittenberg, of stone [illegible] wood, 1000 feet long; and Magdeburg, where there [illegible] three wooden bridges, one across the Old Elbe 76 r[illegible] long; another across the main arm of the river, 24 r[illegible] and the third across a side arm 20 roods long.

The waters of the Elbe are increased by the confluence of 17 rivers and upwards of 70 minor streams. Between the years 1801 and 1835 its depth has decreased n[illegible] 8¾ inches at Dresden, and about 18¼ at Magdeburg. [illegible] Bohemia, where less attention has been paid to the [illegible] of woodlands and drainage of swamps and marshes th[illegible] the territories through which the Saale, Mulde, and B[illegible] Elster flow, the diminution has been far less. The b[illegible] is estimated to occupy about 58,800 miles, and lies between 50° 2′ and 53° 54′ N. lat., and 8° 41′ and 16° 12′ E. l[illegible]

This river is well stocked with fish, particularly salmon, eels, and sturgeons.

ELBERFELD, a circle in the eastern part of the [illegible] or administrative circle of Düsseldorf in the Prussian [illegible] vince of the Rhine. It contains an area of about [illegible] square miles, three towns (Elberfeld, Gemarke or B[illegible] and Mettmann, with about 2100 inhabitants), one [illegible] village, 21 villages, and 135 hamlets, and has a popul[illegible] about 93,500; which is an increase of 22,750 since [illegible] 1816. About one-fifth are Roman Catholics, a[illegible] remainder Protestants. The circle is traversed in all [illegible] by offsets of the Sauerland hills, and is well wooded [illegible] tensive beds of alum lie between Velbert and Lange[illegible] in the northern part of the circle, where a number [illegible] works are established. Elberfeld is watered by the R[illegible] Wipper or Wupper, Düssel, and 26 minor strea[illegible] brooks. The soil is in general but of middling qua[illegible] some of the more elevated districts it is light, and [illegible] lated for the cultivation of rye, oats, and potatoes. In the others, wheat, rye, barley, oats, peas, and fl[illegible] raised. There are excellent meadow and grazing [illegible] The vicinities of Elberfeld, Barmen, Hardenberg, and [illegible] enberg are crowded with manufactories of cotton [illegible] and cloths, silks, woollens, linens, ribbons, lace, [illegible] stockings, iron and steel wares, leather, &c. The stock of cattle in 1831 was composed of 1881 horses, 8261 horned cattle, 1524 sheep, 2511 goats, and 1847 swine.

ELBERFELD, the chief town of the circle, lies in a pleasant situation upon the right bank of the Wupper, which is 500 feet higher at this spot than at its junction with the Rhine below Opladen: in 51° 16′ N. lat. and 7° 8′ E. long. It is an open well-built town, and stands at an elevation of 492 feet above the level of the sea. The streets are long, but few of them are of any great breadth, as the place is built partly between hills and partly upon them. It is divided into two quarters, the Island and the Liberty, and contains three churches, one of which is Roman Catholic, a gymnasium, a school of trade, a mechanics' school, 12 elementary schools, two orphan asylums, three hospitals and infirmaries, about 650 manufactories, large and small, 2500 private houses, and about 23,200 inhabitants. This is a great increase since the year 1801, when their numbers were 11,230; from which they rose to 15,085 in 1817; 21,627 in 1828, and 23,298 in 1831. Among other establishments in Elberfeld are a museum, a society of the arts and sciences, a bible, a missionary, and a tract society, a savings' bank and loan bank, and a German American mining society. There is no town in the Prussian dominions which carries on such extensive manufactures and none which has a more flourishing trade. The chief manufactures are thread-lace, of which above 80,000*l.* in value are annually made; silks, for the weaving of which, ills, upwards of 1100 looms, more than 25,000*l.* a year are paid in wages; cotton cloths, plain and printed, in which 45 factories and above 2000 looms are employed; coverlids to the extent of 20,000 per annum; thread linens, damask cloths, tapes, iron-ware and cutlery, ribbons, stockings, leather, potashes, furniture, &c. There are several bleaching-grounds and establishments for dyeing; nearly 300 merchants and manufacturers; and the yearly amount of bills passed on the exchange of the town is said to be upwards of 1,500,000*l.* sterling, in which sum the large manufacturing districts of Barmen, Kronenberg, Langenberg, &c., are comprised.

The earliest historical record of Elberfeld is of the twelfth century, when a burg occupied a small portion of its site, which belonged to the Elverfelds, a family whose descendants established the first manufactures. The Reformation was introduced here in the year 1552. It is the seat of a tribunal of commerce and two courts of arbitration. Elberfeld is also a township (Bürgermeisterei) with 32 hamlets, and contained, at the close of the year 1836, 34,257 inhabitants. In that year the births were 1650, the deaths 1132, and the marriages 353. It lies about 19 miles east of Düsseldorf.

ELBING, a circle of the county or administrative circle of Danzig, in Western Prussia, is bounded on the north by the Frische Haff, the south and west by the circle of Marienburg, and the east by the province of East Prussia. It contains about 258 square miles, two towns, 222 villages, and 5522 dwelling-houses, and had in 1831 a population of [illegible]. The north-western part is traversed by a chain of hills, which are connected with East Prussia. The soil is exceedingly fertile, and has luxuriant pastures; it produces an abundance of grain, and fruits and vegetables of the best sorts, especially in the south-western part. Elbing is well watered by the navigable rivers the Nogat and the Elbing, besides numerous smaller streams and canals. The fishery is productive. Owing to the great scarcity of wood, except in the forest near the town of Elbing, the inhabitants are obliged to use turf. Next to Danzig, Elbing has the most manufactures in the government; the chief are those of tobacco, soap, sugar, vitriol, wood, &c. It also carries on a considerable trade in corn, wood from the Upper Vistula districts, horse-hair, leather, packing-cloth, fustian, butter, fruits, wool, potash, &c. The circle, besides Elbing, contains the town of Tolkemit, on the Haff, with 1800 inhabitants.

ELBING (Elbinga, Polish Elbiag or Elbing, also called [illegible] Drusana), chief town of the circle, and a place of considerable commercial importance, is situated on the navigable river of the same name, which is united to the Nogat by the Kraffuhl canal about four miles north of the town. It lies in 54° 10′ N. lat., and in 19° 25′ E. long., in a very fertile valley, and is surrounded by high walls, towers, and ditches. It is divided into the old and new town, three inner and eleven outer suburbs, and has five land and two water gates, five Lutheran churches, one reformed, and one Roman Catholic, one synagogue, five hospitals, one convent for elderly females, an orphan asylum, workhouse, house of correction, house of industry, the Pott and Cowle Institute, founded by Richard Cowle, who died in 1621, a savings' bank, a Lutheran gymnasium, with a large library, besides other establishments for the education of the poor. The various benevolent institutions are admirably conducted.

Elbing was founded by the Teutonic knights about the year 1229; in the fourteenth and fifteenth centuries it was a member of the Hanseatic league, but afterwards declined when Danzig engrossed the trade with Poland; and the frequent wars between Poland, Prussia, and Sweden, stopped the intercourse. It however revived during the occupation of West Prussia by Frederick II., and now ranks in the second class of towns in the Prussian monarchy.

The population in 1817 was 18,524, of whom 225 were Jews; in 1831 it was 17,761, of whom 2480 were Roman Catholics, 358 Mennonites, and 330 Jews, besides the garrison. The inhabitants carry on manufactures of tobacco, sail-cloth, soap, starch, caviar, stockings, oil, and linen; there are also tan-yards, ship-building, &c. It has a brisk trade with Poland, from which corn, potash, wood, linen, wool, tallow, and wax are obtained; and iron, wine, manufactured and colonial goods, &c., are sent in exchange. The shipping business too is considerable; the townsmen are owners of a great number of large vessels and coasters; and many vessels are built here. By the Kraffuhl canal small vessels can come up to the wharfs, but the larger ones are obliged to unlade in the depth of Pillau, which is the harbour of Elbing. About 1400 vessels enter the port every year; but the greater portion of these are vessels of small burden. There is likewise a considerable fishery, particularly in sturgeon.

ELBŒUF, a town in France, in the department of Seine Inférieure. It is on the left bank of the Seine, seventy-nine miles from Paris by Mantes, Vernon, Louviers, and Pont de l'Arche. The town is situated in a pleasant valley, and may be recognized afar off by the chimneys of its numerous steam-engines. Elbeuf appears to possess little that is worthy of notice, except the choir of the church of St. Etienne. The population of the town in 1832 was 9951, that of the whole commune 10,258: the inhabitants have been engaged since the latter part of the seventeenth century in the manufacture of woollen goods; tapestries were long included in their productions, but this branch of industry has been nearly or quite given up; woollen cloths are now the staple manufacture; and Elbœuf is the centre of a prosperous branch of industry. There were at the publication of M. Dupin's 'Forces Productives et Commerciales de la France,' (Paris, 1827,) in and round the town 1200 looms, furnishing employment to 2700 weavers, and 4300 workmen of other kinds employed in the various branches of the woollen trade. The cloth is purchased of the small manufacturers by wholesale houses of extensive business (by which the cloths of Louviers are also purchased), and by them sold and sent into various parts of France, especially to Paris, Lyon, Limoges, and Bordeaux. The wool formerly employed by the clothiers of Elbœuf was Spanish; latterly, the wool of the neighbouring country, owing to the improvement of the native sheep by crossing the breed with the Merinos, has to a considerable extent replaced that of Spain. Elbœuf has a large charity-school, in which, in 1823, 400 girls were taught.

ELBORUS, ELBURZ, or ELBROOZ. [CAUCASUS, p. 382.]

ELCAJA, an Arabian plant, whose fruit is said to possess emetic properties. Botanists call it *Trichilia emetica*. Forskahl describes it as a large tree, with villous shoots, pinnated leaves, with entire oval oblong pedicellate leaflets, clustered flowers with five greenish-yellow petals, ten monadelphous stamens, and a downy capsular fruit about an inch long, with three valves, three angles, and three cells, having two plano-convex seeds in each cell. The tree is said to be called Roka, and to be common on the mountains of Yemen. The fruit is sold at Beit el fakih, for mixing with fragrant materials with which the Arab women wash their hair. The fruit called *Djouz elkai* is reputed an emetic. The ripe seeds mixed with *Sesamum* oil are formed into an ointment as a cure for the itch.

ELCHE, the Illici of the Romans, is a considerable town in the kingdom of Valencia in Spain, situated on the river Segura, in a fertile plain covered with vines and palm-trees. The latter is the date-palm, with a thick wood of which the town is surrounded to the distance of half a league. Though there are several good streets and squares, the town has on the whole a melancholy aspect. Among the most remarkable buildings is a ducal palace, which is evidently the work of a very remote age. The great church is a beautiful edifice, with a noble dome. The barracks are well built and extensive. There are besides many convents and charitable institutions for the poor. Population, 15,000.

ELDEN HOLE. [Derbyshire.]

ELDER TREE. [Sambucus.]

EL DORA'DO, literally the golden country, was the name given by the Spaniards in the 16th century to an imaginary region somewhere in the interior of South America, south of the Orinoco and between that and the Amazon river, where gold and precious stones were supposed to be as common as rocks and pebbles in other countries, and to be had for merely picking them up. The first notion of this story was communicated by an Indian Cacique to Gonzalo Pizarro, brother of the conqueror, who sent his companion, Francisco Orellana, down the Amazon river to discover this wonderful land. Orellana followed the course of the Amazon down to the sea; but though he did not find El Dorado, still he countenanced the report of its existence. The temper of mind of the Spanish conquerors and discoverers of America seems to have been singularly fitted for credulous belief in all wonderful reports. The story of El Dorado continued to be accredited; a Spanish adventurer was said to have reached the capital of this enchanted region, called Manoa, and wonderful tales were told of its splendour and its wealth, far surpassing those of Peru. The Spanish governor of Guiana was also styled governor of El Dorado, because the latter country was reckoned to belong to his jurisdiction. Raleigh was so persuaded, or pretended to be persuaded, of the existence of this wonderful country, that he fitted out several expeditions for the purpose of discovering and conquering it for England: his last attempt in 1617 involved him in hostilities with the Spaniards of Guiana, which ultimately led to his death on the scaffold. [Raleigh, Walter.]

ELEATIC PHILOSOPHY has its name from Elea (called by the Romans, Velia), a Grecian colony on the western coast of Lower Italy, where Xenophanes of Colophon settled in his old age (about 530 B.C.), and founded a school distinguished by its bold attempt to construct a system of the universe upon metaphysical principles. The theory was brought to perfection by Parmenides, but it also reckons among its members Zeno, Melissus, and Empedocles, who however only gave a further development to particular principles; the labour of Melissus being mainly confined to the defence of those positions which were opposed to the Ionian physics, while Zeno and Empedocles exhibit the opposite aspects of the theory, the former confining himself to its doctrine of the supra-sensible, the latter to a detailed application of its physiological views.

In its formation it was subsequent to the Ionian and Pythagorean schools, and was so far a consequence of them as it thought necessary to submit to investigation the legitimacy of the principles upon which they had proceeded. The problem which they had proposed to themselves was, assuming the possibility of a beginning of motion and of production and decay, to determine the first ground or grounds of all that comes into being. This assumption the Eleatæ attacked as irreconcilable with that idea of the reason which involves the law of causality, the Eleatic expression for which was, 'out of non-being being cannot come,' and its later and more general formula, 'ex nihilo nihil;' and as no distinction had as yet been made between the efficient and material causes, they necessarily arrived at the conclusion that the world had not a beginning.

With the founder of the school religious considerations predominated, and in order to refute the unworthy conceptions of the Deity to which polytheism had given rise, he showed from the very notion of God that he is necessarily one. The notion of Deity, he argued, implies his infinity and eternity, but there cannot be many infinite beings; the eternal and infinite God is therefore one. But from the denial of production it followed that the world is eternal. Now an eternal world would equally limit the eternal God: the co-existence, therefore, of the two, separately and independently of each other, is impossible: consequently the world and the Deity are one. Thus results the foundation of the so-called error of Pantheism; but it was only by such an error that man could arrive at a right and worthy conception of the Deity, which it is the merit of the Eleatæ to have distinctly propounded.

From the position that God or the world is one, it necessarily followed that our conceptions of sensible things singly are imperfect and insufficient to bring us to a knowledge of the All or of God. Man, consequently, is placed in a painful situation, desiring on the one hand to know God, on the other to look to individual phenomena. Attention was thus awakened to the opposition which exists between the pure truth and the sensible appearance, and the Eleatæ were the first to advance a systematic theory of human knowledge; and although its object was to deny the validity of the testimony of sense and experience, and to ascribe to the reason exclusively the merit of arriving at the truth without any attempt to reconcile appearance and reality, it nevertheless constituted a most important advancement of the philosophy of the period, and so completed its edifice as a system by contributing the dialectical or logical portion; the Ionians and Pythagoreans having respectively constructed the physical and moral parts.

In conclusion, we must observe that the history of this as well as of the other early schools of Grecian philosophy is both obscure and imperfect, since of the written works of its several members we only possess a few and unconnected fragments.

ELECAMPANE, the herbalist's name of the plant called Inula Helenium. Mr. Burnett speaks of it thus:— It is by some persons esteemed as a grateful stomachic; its leaves are aromatic and bitter, but its root much more so. The former were used by the Romans as pot-herbs, and it would appear were held in no mean repute in after times, from the monkish line, 'Enula campana, reddit præcordia sana.' When preserved, it is still eaten as a cordial by Eastern nations, and the root is used in Europe to flavour certain sorts of confectionary that bear its name; and it enters into the composition of several continental carminatives. It is seldom used in England except in veterinary practice, or by fraudulent druggists to make an emetic powder, by the addition of tartrate of antimony, and then sold as a substitute for ipecacuanha. A peculiar proximate principle, something resembling starch, was first detected in the roots of this plant, and hence called Inulin; it has since been discovered in the tubers of the Jerusalem artichoke, the roots of the common pellitory, the angelicum, the cormus of the colchicum, &c. [Inula.]

ELECTION (Lat. *electio*), in divinity, is a doctrine which, on the authority of Scripture, and as a consequence of the omniscient and prescient attributes of God, teaches that from all eternity the destiny of every individual of mankind was determined by an immutable decree, some (the elect) being ordained to eternal salvation, while others (the reprobate) are left to inevitable and eternal damnation. The term election is often considered as but another name for the doctrine of predestination, both implying that man is subject to a certain predetermined fate. This doctrine in modern times is associated constantly with the name of Calvin, though similar notions were maintained or opposed among the philosophical and religious sects of the ancient Gentiles, Jews, and Christians. The Essenes were believers in absolute preordination. The Sadducees rejected it, and adopted the doctrine of moral freedom. The Pharisees, in a theory of syncretism, endeavoured to reconcile and combine the two extremes. (Josephus, *Antiq.* [illegible]) The Stoics insisted upon the doctrine of predestination or necessarianism; while the rival sect of Epicureans maintained that of the perfect free agency of man and the contingent nature of events. The Gnostics taught that human souls, according as they emanated from the good or evil principle, were destined to happiness or misery. In the systems of Manes (Manichæism), Marcion, Cerdon, and others of the second century, similar doctrines were enforced concerning the fixed inevitable fate of men. Throughout the first four centuries the pagan philosophers, especially those of the Stoical school, opposed the dogmas and miracles of Christianity by alleging the principle of necessity as exhibited in the immutable series of causes and effects, or antecedents and consequents, in the physical and mental phenomena of nature, and the ignorant pagans were confirmed believers in the influence of fortune and tianity. Justin Martyr, Irenæus, and most of the Greek fathers, in defending the Christian system, resorted therefore to arguments tending to establish anti-predestinarian doctrines. Origen, in the third century, had taught that man, in his moral and religious agency, is not necessitated by omnipotent decrees of God. His tenets were adopted in Palestine, and throughout the East, especially by Chrysostom, Isidorus, Theodoret, and the other Greek fathers; and Pelagius, an English monk, proceeding on their authority, promulgated in the first half of the fifth century the generous theory designated Pelagianism, which asserts free agency, moral responsibility and perfectibility, making good works meritorious, and denouncing the predestinarian doctrine of imputed guilt and inherited depravity. (Pelagius in Pluquet's *Dict. des Hérésies.*) St. Augustin was among the most strenuous opponents of Pelagius, and adduced abundance of scriptural authority to show the absolute omnipotence, the omnipresence, and consequently the preordination of God, with respect to the characters and destiny of men, showing some to be elected by the divine will as objects of especial grace, and others to be abandoned to the perdition which through Adam is merited by all. (St. Augustin, *De Gratiâ, De Peccat. orig., De lib. arbitr., De Dono Perseverantiæ.*) The arguments of St. Augustin occasioned the formation in the fifth century of a sect in Africa called Predestinarians, the tenets of which were zealously propagated in Gaul by a priest named Lucidus, who was excommunicated and anathematised by the church in council. (See the treatise of Père Sirmond on this heresy, and the replies of the Jansenists and divines of Port Royal.) In the ninth century, the Predestinarian controversy was revived with great enthusiasm by Gottescalque, a French Benedictine monk, who was condemned, and terminated his life in a dungeon, for teaching the 'five points' concerning election, which subsequently gained for Calvin so much celebrity. Gottescalque was answered by Scotus Erigena, and many others. (Dufresnoy, *Tablettes Chronolog.*) This incomprehensible subject formed one of the great points of subtle disputation in the scholastic theology; it was discussed by 'the Angelic Doctor,' Thomas Aquinas, and others, in the thirteenth century. Whether God's election was before or after the prevision of human merits was a standard thesis for the exercise of syllogistic skill (electio ante vel post prævisa merita). Aquinas sustained the doctrines of Augustin, and the controversy was subsequently carried on in the sixteenth century between his followers (the Thomists) and the adherents of Louis Molina (the Molinists). When Luther began to form his opinions, he perceived that nothing could so effectually demolish the Catholic doctrine of justification by works as the predestinarian theory of St. Augustin, which he therefore enforced in his writings; but finally he was induced by Melanchthon to mitigate the rigour of his opinions concerning man's passive subjection to God's eternal decrees. By the Socinians the certain prescience of future events by the Deity is denied, and the divine decrees are maintained to be merely general, and not specially relative to particular persons. The system of Calvin is set forth in his great work entitled 'Institutes of the Christian Religion' (Institutiones, &c.), in which he states that 'no one desirous of the credit of piety can dare to deny God's predestination of some to eternal happiness, and of others to eternal damnation;' that 'every man is created for one or the other of these purposes,' God having from all eternity fixed the destiny of every individual of the human race, all of whom, in consequence of Adam's offence, have been, are, and to the end of time will be, under the curse and wrath of God, and justly subject to everlasting punishment; that salvation depends wholly on God's will; that particular persons, without any regard whatever to their merits or demerits, are elected, or rejected for ever; and that God is an absolute, tremendous, and incomprehensible Judge. Such propositions, it must be confessed, are sufficiently mysterious and fearful to overwhelm the timid with despair, and excite the bold to inquire if they are founded in truth. One of the ablest works in confutation of Calvin is Dr. Whitby's discourse on the five points of his system, which are as follows:—1. God, before the creation, was pleased to choose, without prevision of merit, some of mankind to enjoy everlasting happiness, and others to suffer everlasting misery. What was certainly foreseen must certainly come to pass, as the prescience of the omnipotent and omniscient Being must be coincident with, and not by possibility antecedent to, his decrees. 2. Atonement was made by Christ only for the sins of the *elect*. His death did not make the salvation of all *possible*, and dependent on the performance of certain conditions; for if God intended salvation for all, doubtless all must be saved; and if Christ died for all, he died in vain for many, which is a supposition absurd and impious. 3. By original sin, that is, the imputation of Adam's guilt, all are by nature in total depravity, which justifies the consignment of the whole human race to eternal misery, and makes the election of some to happiness an act of God's especial grace and good pleasure. 4. All the elect are effectually called at some point of time in life when the influence of the divine grace is first communicated. 5. As all who are not elected must be damned, so all those who are elected must be saved; irresistible grace necessitates all their actions, and inevitable salvation must terminate their 'final perseverance.'

The following are some of the scriptural authorities alleged in support of these doctrines: Ephesians i. 4, 5, 11, some chosen before the foundation of the world; predestinated according to God's pleasure: Acts xv. 18, God's foreknowledge: Rom. viii. 29, 30, 33, those foreknown, predestinated, called, justified, and glorified, are God's elect: Matth. xxv. 34, to inherit a kingdom eternally prepared for them: Acts xiii. 48, those ordained to eternal life believe: Rom. ix. 11, 18, 21, 22, 23, election before birth, and not according to works; God's power absolute; mercifully favours some and hardens others. Divine election is considered to be shown in the acceptance of Abel, and the rejection of Cain; in God's love of Jacob, and hatred of Esau (Malachi i. 2, 3); in the two men in the field; the two women at the mill; and the two in a bed, of whom one was taken and the other left (Luke xvii. 34; Matth. xxiv. 40).

Arminius, a professor in the University of Leyden, became, at the commencement of the seventeenth century, the chief of Calvin's opponents, who were thence called Arminians, and Remonstrants, from the *remonstrance* which they addressed to the Dutch government against Calvinistic intolerance. But the rigid Calvinists, headed by Gomar (Gomarites), being by far the most powerful party, Arminius and his adherents were condemned at the general synod of Dordrecht, convened for the purpose in 1619. (Scott's *Synod of Dort*, pp. 112-124.) At this synod the standard points of strict Calvinism, with respect to election, were determined upon and established. That the homilies and articles of the English church, especially the seventeenth, are confirmatory of the Calvinistic views of election, is beyond dispute, though many Arminian expositors have made laborious efforts to explain away their obvious original purport. Bishop Burnet, in his exposition of the articles, observes, that the seventeenth, on Election and Predestination, 'has given occasion to one of the longest, the subtlest, and the most intricate of all the questions in divinity.' It displays in fact the *medulla* of Calvin's Institutes, precisely involving all the doctrinal particulars of his 'five points,' and asserting that, to the *elect* predestination 'is full of sweet, pleasant, and unspeakable comfort; while to the *reprobate* it is a most dangerous downfall, whereby the devil doth thrust them into desperation and wretchedness.' Baxter endeavoured to reconcile the doctrines of Calvin and Arminius. Arnauld, in his treatise on the subject, contends that the Calvinistic predestination directly overthrows all the principles of morality; though many others, including Dr. Chalmers, in his recent course of lectures on Predestination, assert the contrary. To enumerate the various modifications of this doctrine, which at different times have been maintained by distinguished theologians, would be endless. Some, as Origen and the Catabaptists, have denied that any *one* is predestined to perdition, and contended that salvation will be finally extended to every one of God's creatures, including the devil and all his angels. (Bullinger, *Contra Catabap.*) The following *references*, in addition to those already given, may be useful to the studious inquirer.—

(Cudworth's *Free Thoughts on Election*; Diderot, *Encyclop.*, articles Prédestination, &c.; Bossuet, *Hist. des Variations*, liv. 14; *Westminster Assembly's Confession of Faith* (Calvinistic); Mosheim's *Eccles. Hist.*, vols. iii. and iv.; *Authentic Documents relating to the Predestinarian Controversy under Queen Mary*, by Archbishop Lawrence, 1819; Finch's *Examination of Cudworth's Free Thoughts on Elect.*, 1755. A list of numerous treatises on Election, written in the sixteenth and seventeenth centuries, and of sermons for and against the doctrine, may be seen in Watt's *Bibliotheca*, and Du Pin's *Study of Divinity*.)

ELECTION (law) is when a man is left to his own free will to take or do one thing or another which he pleases (*Termes de la Ley*); and he who is to do the first act shall have the election. As, if A covenants to pay B a pound of pepper or saffron before Whitsuntide, it is at the election of A at all times before Whitsuntide which of them he will pay; but if he does not pay either before the time fixed, then it is at the election of B to sue for which he pleases. So, if a man give to another one of his horses, the donee may take which he chooses; but if the donation be that he will give one of his horses (in the future tense), then the election is in the donor.

Courts of equity frequently apply the principle of election in cases where a party has inconsistent rights, and compel him to elect which he will enforce: as, if A by his will assumes to give an estate belonging to B to C, and gives other benefits to B, B cannot obtain the benefits given to him by the will unless he gives effect to the testator's disposition to C. It does not appear to be quite settled whether the party electing to retain his own property in opposition to the instrument is bound to relinquish only so much of the property given to him as will be sufficient to compensate the disappointed parties, or whether his election will be followed by absolute forfeiture of the whole. The arguments on both sides are ably stated 1 Roper, Husb. and Wife, 566 n.; 1 Swanst. Reports, 441; 2 Coke's Repts., 35 b., Thomas's note. The principle of election is equally recognized in courts of law, though they are seldom called to adjudicate upon it, except where the alternative is very distinct, or the party has already elected. Indeed this principle is of universal application, and prevails in the laws of all countries; it is applicable to all interests, whether of married women or of infants; to interests immediate, remote, or contingent; to copyhold as well as to freehold estates; to personalty as well as to realty; to deeds as well as to wills.

Courts of equity also will compel a plaintiff suing at law as well as in equity, or in a foreign court as well as in the court in England, for the same matter, at the same time, to elect in which court he will proceed, and will restrain him from pursuing his rights in all others. There are some exceptions to this doctrine, as in the case of a mortgagee, who may proceed in equity for a foreclosure, and on his bond or covenant at law at the same time; but this arises from the difference of the remedy, and from the original agreement to give the concurrent remedies: and even in such a case a court of equity will restrain a mortgagee from enforcing his judgment at law upon the bond or covenant, if he is not prepared to deliver up the mortgaged property and the title-deeds belonging to it.

On Election under a will in the Roman Law see *Dig.* xxxiii. tit. 5, De Optione vel Electione Legata: and as to the French Law, see the *Code Napoléon*, art. 1189, &c., Des Obligations Alternatives.

ELECTOR. [Boroughs of England; Commons, House of.]

ELECTRA. [Cellariæa, vol. vi. p. 401.]

ELECTRICITY (ἤλεκτρον, amber). The electric phenomena, connected as they are now known to be by certain well-ascertained laws, form together the most complete and important addition to the physical sciences which has been made since the time of Newton.

The simplest and most usual mode of producing electricity is by friction. When any two substances are rubbed against each other briskly it is always produced; but it is only a particular description of bodies called non-conductors that retain it after it is thus produced so as to exhibit its primary effects of attraction and repulsion.

The production of electricity may be observed in a very familiar manner thus:—Tear up a piece of paper into small fragments, and place them on a table; then take a stick of sealing-wax, and rub it briskly with a piece of flannel, or against the sleeve of a cloth coat, and immediately after hold it near the fragments of paper; these small pieces will be soon observed to be agitated and the smaller to fly with considerable velocity to the wax, to which having adhered for some time, some will suddenly jump off, others which have touched the stick edgeways will dangle from it a considerable interval, and then fall off by their own gravitation when the electrical force has sufficiently subsided. It was by observing amber produce similar effects after friction to those we have described that electricity obtained its name.

Glass is now more commonly employed to produce electricity than any wax or gum; and there is a striking difference in the kind of electricity then generated, which we shall afterwards notice more at length. These bodies are non-conductors, as they manifestly retain their electricity beyond the moment of its production, and they are isolators because a conducting substance will also retain its electricity when communication with the earth, or other conducting substances, is cut off by means of non-conducting supports or envelopes.

Water is a conductor of electricity; for if you immerse a conducting isolated and electrised substance in water, it will completely lose its electrical properties. Perfectly dry airs or gases, on the other hand, are non-conductors; for if not, none of the phenomena mentioned could have been observed, as the experiments are not made in vacuo. We are not aware that it has yet been established whether the vapours of all substances are conductors (or all the gases non-conductors). Aqueous vapour certainly is a conductor; and therefore when the air is impregnated with moisture it is difficult to perform any electrical experiments which require duration.

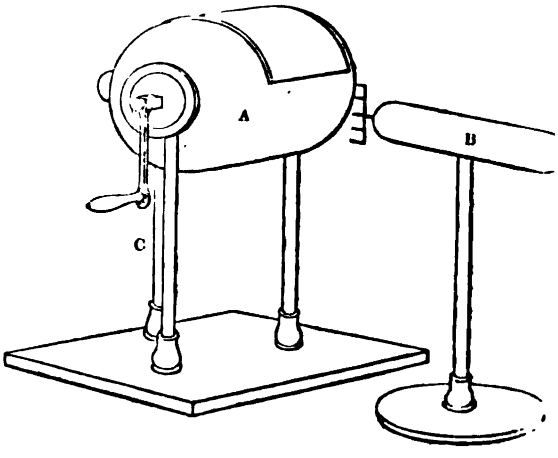
Hence a conductor constitutes a channel by which the electricity produced on a non-conductor will gradually escape, and a non-conductor constitutes an isolator by which the electricity communicated to a conductor may be retained.

Thus, place an electrified glass tube on a tin stand, and the metals being conductors, the electricity will be gradually dissipated; on the contrary, place an electrised tin cylinder on a glass support in dry air, and the electricity will be retained for a very long time.

Nevertheless it is far from improbable that this is a question only of degree; that all substances are conductors, and that the usual terms conductor and non-conductor strictly mean quick conductor and slow conductor.

When an electrised body is brought near the skin where the power of touch is delicate, a sensation is produced which has been compared to that produced by the touch of a cobweb; but instruments founded on the laws of electric action have been constructed, which indicate the presence of electricity in its most feeble state, and measure its tension. [Electrometer.]

Previous to our study of the properties of electricity, on which the construction of the best machines for producing it in large quantities depends, it will be useful to describe a simple apparatus, and one easily constructed or procured, by which we may learn the first laws of electrical action.



A represents a glass cylinder of which the axis is supported on a frame, and which is pressed against by cushion stuffed with horse-hair, and covered by an amalgam of zinc and mercury spread over its surface; this cushion is attached to a conducting bar C, such as a lamina iron connected with the frame, and with it communicates with a table or the ground.

At one extremity of the axis of the cylinder is attached a handle by which it may be rapidly turned round, and the friction which is generated against the cushion will produce electricity on the surface of the glass, to guard [illegible] against the action of the pressure of the air, the upper side of the cylinder may be lapped over by a piece of glazed taffeta in the direction of the rotatory motion of the cylinder.

D is a long narrow and hollow metallic cylinder standing on a glass support, and having at the extremity near A a small cross bar garnished with points or teeth presented towards the cylinder. It is called the conductor in this apparatus.

When the cylinder A is turned briskly round, the motion will be accompanied by a crackling noise and if in the dark, streams of light of a bluish hue will be perceived directed to the several points on the projecting bar of the conductor.

It may be thus charged with electricity, and when removed from the presence of the cylinder (taking it away by its isolating support), it will retain its electrical properties (the longer as the air is more free from moisture), and will by simple contact communicate a portion of its electricity to another isolated conducting substance, or be discharged by touching one not isolated. If, with a feeble charge, it is touched by the finger, a sensation like the pricking of a needle is felt, accompanied by a faint spark apparently penetrating the finger.

It is useful to cover the glass supports at their points of contact with gum-lac, which is an excellent isolator.

Glass plates are now in more general use than cylinders for the production of electricity by friction. It would be impossible here to describe the varieties of electrical machines which have been constructed. Perhaps the most perfect apparatus for producing electricity, and also measuring its quantity, is that employed by Mr. Snow Harris, and which is described in his paper on Electricity in the Philosophical Transactions; a valuable memoir, which contains also some remarks on the electrical state, which are there established with much accuracy, in the mode of performing the experiments on which they are founded; though we do not acquiesce with some of the inferences drawn by the author.

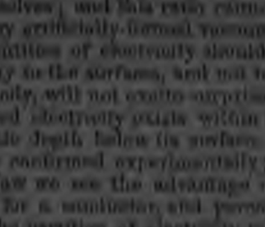
We shall now observe, as our first phenomenon, that neither the cylinder which has generated and given out electricity, nor the conductor which has acquired it, exhibits the least alteration of weight, nor will the greatest possible accumulation of electricity produce the least perceptible alteration in this way. Those who suppose that electricity is a distinct species of matter, an all-pervading fluid, have therefore denominated it *imponderable*. Facts do not, however, authorise us yet to take this view of it, or to regard it as essentially different from the forces which the molecules of matter exercise, which, though neutralised for external bodies when these molecules are in positions of equilibrium or stability relative to their mean places, may become sensible by impressed forces, such as friction, which would alter the position of their poles, or by sudden concussion forcibly altering their relative situations. There is a convenience of language, however, in speaking of it as a fluid, which can lead to no error by its adoption until the phenomena of molecular action are more studied, and the views of Mossotti and many other natural philosophers with respect to the identity of these forces better established. Adopting, therefore, this hypothesis, the sense in which we speak of its quantity, its accumulation, its density, or its position between bodies, may be readily translated into the hypothesis founded on the views of molecular action if we should find any occasion for it.

The next phenomenon to notice is the limit to the quantity of electricity we can communicate to a perfect conductor. If, from different sources of electricity, we charge a metallic ball, and so continue to charge, we shall find that there is a limit beyond which we cannot communicate more; for on attempting so to do, the ball will discharge itself through the air into the nearest conducting body, when a spark, describing apparently a zigzag course, will be observed, the colour of the light being dependent on the medium it traverses. This spark travels with immense velocity, and is accompanied by a very audible sound; and if received by the body of a man or animal, it produces through a part or the whole of the system an instantaneous muscular contraction, which may be rendered sufficiently strong to cause death, but in more moderation has been used in some diseases, as deafness, though its use has become by no means general.

Two points determine this limit, or fix the charge of which a perfect conductor is susceptible. The first is the extent of its surface; for if two bodies have similar figures, the quantities of electricity of which they are capable are proportional, not to their solid content or weight, but to their surfaces; that is, to the square of their linear dimensions. The second is the pressure of the non-conducting medium by which they are encompassed. The quantity of electricity is then as the square root of the pressure. When placed in an artificial vacuum, an electrical light is observed along the sides of the machine. Mr. Harris has shown that dry air, considerably rarefied by the action of the pump, will suffice to retain the electricity of a body for a long time; but it should be remembered that the square root of two quantities gives a much lower ratio than the quantities themselves; and this ratio cannot be considered very small in any artificially-formed vacuum.

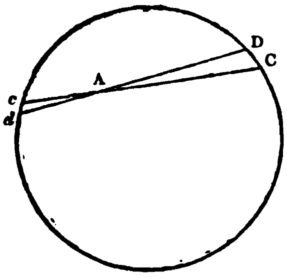
That the quantities of electricity should follow the law of proportionality to the surfaces, and not to the content or weight of the body, will not excite surprise when we state that no developed electricity exists within a body, at least to any appreciable depth below its surface. This fact has been repeatedly confirmed experimentally; and in consequence of this law we see the advantage of using a long cylindrical form for a conductor, and perceive the proportions in which the partition of electricity takes place when several similar conductors communicate.

We come now to the third and very important phenomenon of the mutual repulsion of the different parts of developed electricity: these parts repel each other with forces which vary inversely as the square of the distance. We may easily witness this repulsion in the following familiar manner. Take a small well-dried ball of elder-pith, and suspend it from the hand by a fine silk thread, which is a good non-conductor; then bring it near the conductor of an electrical machine, or to a body to which this conductor has communicated electricity. The ball will at first be attracted to this body; but when it has touched it and shared a small portion of its electricity, it will be repelled from it and will stretch the string by which it is suspended in a slant direction, until the obliquity is sufficiently great for its own gravity and the tension of the string to counterpoise the repulsion of the electricity on the conductor. Let two pith balls be suspended by parallel strings



so as to touch each other, as A, B, and if a portion of electricity be communicated to them by temporary contact with a body already charged, the strings will diverge in consequence of the mutual repulsion, and the balls will come into the positions *a*, *b*, where, notwithstanding their gravitation, they will remain a considerable time, if the air be very free from moisture. They will be observed gradually to close in towards each other as they lose their electricity from the contact of the surrounding medium.

That the law of force in this case is, as in gravitation, expressed by the inverse square of the distance, was satisfactorily demonstrated by Coulomb by means of his torsion balance, the principle of which we have before explained [ELASTICITY], and has been lately confirmed by Mr. Harris's experiments; and a remarkable fact arises from it, namely, if the electrised pith-ball A be placed any where within the concavity of a spherical shell, it will not be moved in any direction by the repulsion of the electricity on the surface of the shell; for the electricity being then uniformly distributed, the intensity of the force of any small portion DC is as its extent, or proportional to the square of the arc DC, and is therefore destroyed by the action of an opposite portion dc, cut off by a conical surface having A as vertex, and DC as base; for $DC : dc :: DA^2 : dA^2$, that is, what the portion gains in extent it loses in its distance from A. This law was first demonstrated by Newton (*Principia*, book I.), and it was afterwards shown by other analysts, that by no other law of force but that stated could the same mutual protection of forces ensue (Laplace, *Mécanique Céleste*,



tom. .., liv. 2; Murphy's *Electricity*, chap. iii.); and Poisson, from other considerations which we shall afterwards notice, made this condition, for a body of any figure, the ground of his calculations on the distribution of electricity over the surfaces of bodies.

When electricity is produced, as above described, and a conductor charged, if the conductor be removed, and another conductor replace it, the latter will become charged by repeating the operation: thus the cylinder and every substance is an inexhaustible source of electricity.

We have supposed the cushion by which the cylinder is rubbed to be in communication with the ground by a conductor; but if two substances both isolated be electrised by friction, and when separated the electricities belonging to each surface be examined, we find the following results:—

Let two isolated pith-balls A and B, as before, be electrised by communication with one of the surfaces, and two other balls *a b* in like manner electrised by the other surface.

Then when A is presented to B, or *a* to *b*, repulsion takes place as before described; but when A is presented to *a*, or B to *b*, they will attract each other; and if A, *a* have equal charges from the different surfaces which have been rubbed against each other other, when contact takes place between A and *a*, all signs of developed electricity will depart from each, and the bodies will take their natural positions, neither attracting nor repelling each other; but if A has a greater electrical charge than *a*, a surplus of the electricity of A will remain, and will be partly communicated to *a* when a consequent repulsion arises.

The same results would occur if two machines were used, in one of which the cylinder is glass, and in the other resin or a gummed substance: the pith-ball which receives its electricity from the glass cylinder will attract that which has been in communication with the other machine.

Hence arise the terms *vitreous* electricity and *resinous* electricity, or, as they are now more usually and properly called, positive electricity and negative; for whatever two substances they may be which are rubbed together when electricity is produced, it will be found positive on one substance, and negative on the other, even if the substances are of the same nature; for instance, both glass.

The phenomenon above noticed may be then announced as follows: 'Like electricities mutually repel, unlike mutually attract;' and the law of force between particle and particle is in both cases the inverse square of the distance.

Moreover, we have seen that the addition of quantities of unlike electricities is similar to the addition of quantities with unlike signs in algebra: when equal the sum is zero, when unequal it is the excess, and of the same name as the greater charge.

Franklin's theory makes only one electric fluid in excess above its natural state in bodies positively electrised, and in defect in those said to be negatively electrised.

Epinus, and most of the continental philosophers after him, suppose two distinct electrical fluids, the particles of each of which repel those of the same kind, but attract those of the contrary, and therefore the opposite electricities always seek combination or neutralization, so that in natural bodies the two fluids exist in equal quantity, by which the presence of neither is indicated.

Mosotti has in some degree revived the theory of Franklin in his memoir on the forces which determine the state of bodies. We adopt at present the theory of two fluids, but all the phenomena may be readily expressed also on Franklin's theory.

The pressure of the electricity on the surrounding medium, when the body is perfectly conducting, determines the direction of the motion under the influence of foreign electrised or non-electrised substances, which, by rendering this pressure unequal on the different parts of the surface, produce motion by the unequal reaction of the medium. But imperfectly conducting bodies have in themselves a certain retentive or coercive force, and the electrical particles, instead of then freely obeying the external impressed force by a corresponding law of arrangement or accumulation amongst themselves, communicate the forces impressed to the particles of matter by which they are restrained. In imperfect conductors the force is partially exercised in each of these ways. The circumstances of the motions of electrised substances therefore vary with their conducting faculty

We can now understand the mode in which light substances are attracted to a stick of sealing-wax which has been made electrical by friction: the electricity of the wax is in this case negative; and when brought near a small piece of paper, which is a conductor, it acts upon the neutral fluid of the paper, attracting some of its positive electricity to the side next it, and forcing the negative to the farther surface, which, being in communication with the ground or a conductor, is carried off; so that the paper is thus *by influence* made positively electrical, which, being of a contrary kind to that of the wax, is attracted by it, and therefore the paper flies to the wax, and having touched it communicates its positive electricity to it, thereby neutralizing a portion of its free fluid; after which it shares a part of the surplus of negative electricity remaining on the wax, when it is of course repelled; and if it become neutral by again touching the ground, and the electrical force has sufficient energy, it will again fly to the wax and the same results will be repeated.

When a body is of an irregular figure, and is electrised, the electricity of its surface will be differently accumulated at the different parts, projecting points having the most, and portions of small curvature the least in convex surfaces; and it is a mathematical problem of considerable difficulty in some cases 'to find the law of the distribution of free electricity on the surface of a perfectly conducting body of a given form.' The datum for the solution is, that the whole action of the electric envelope on any point interior to the body is zero: we have shown that it would be so in the case of a sphere by a uniform distribution on the surface; but in other bodies this distribution cannot be uniform to produce the same effect. The next case in the order of simplicity is the spheroid, or more generally the ellipsoid, for a spheroidal shell, bounded by two similar and concentric spheroidical surfaces, and attracting by the law of the inverse square of the distance, will exercise no action on an internal point; hence the accumulation of electricity on the surface of a spheroid at any point is proportional to the normal breadth of the stratum at that point, which it may be easily proved is proportional to the perpendicular drawn from the centre on the tangent plane, or inversely as the diameter parallel to the tangent at that point.

Hence we see why the accumulation of electricity at points is so great, which are therefore part of the armature of prime conductors; for if we conceive the axis minor of an ellipse to diminish indefinitely, while the axis major remains invariable, the breadth of the spheroid generated will be correspondingly diminished while the length remains the same, and ultimately it will approximate to the form of a needle pointed at the extremities of its axis major. The breadth of the electricity at the point is then to that at the middle of the needle as the length of the needle to its greatest breadth. Now, in consequence of the law of force being the inverse square of the distance, we find the pressure against the air is as the square of the accumulation, and consequently is very much greater at either extremity of the needle than at or towards the middle; and therefore, being overcharged, the electrical spark is given from the extremity, when not otherwise determined by the influence of external bodies.

Moreover, when several conducting bodies, some or all of which are electrised, are placed near each other, a new distribution of electricity takes place on their surfaces, caused by the decomposition of the neutral fluid of each by the action of the extraneous substances: thus, the principle for calculating the distribution in this case on every body is to suppose it such that the total action on any point within each of the conductors shall be zero; for if not, the neutral fluid at that point would be decomposed, and the separated fluids proceeding to the surface of the body would alter the distribution When the distribution is ascertained, then the motions of the bodies may be calculated according to the laws of dynamics, the pressure against the surrounding medium being as the square of the accumulation.

Two spheres placed in contact and electrised will have the point of contact neutral. This result of theory (founded on the principles above detailed), with many others, has been fully confirmed by experiment. Those who wish to follow up the mathematical principle here noticed, may see Poisson's *Memoirs on Electricity* (*Mémoires de l'Institut*), and an English treatise expressly on this subject by Mr. Murphy of Cambridge.

When electricity is generated by the friction of two substances, one acquires positive, the other negative electricity, but it is difficult to judge *à priori*, from the nature of the substances employed, the character of the electricity which each will take; and though most treatises contain tables of substances in which each is positive to that which precedes and negative to the succeeding, yet the nature of the electricity is so liable to alteration, from very minute circumstances of the friction, that it is better, even in each case, to try direct experiment. The friction produced by liquids also produces electricity; the electric light when a barometer tube freed from air is first filled with mercury, having been remarked from the earliest dates of the use of that instrument; and when a current of air is directed against a plate of glass the latter will acquire positive electricity, and therefore the air negative, and the rapid agitation of a piece of silk in the air communicates to the latter positive electricity while the silk acquires negative.

The difference of temperature of a substance often determines the species of electricity it acquires by friction. Generally an increase of temperature disposes to negative electricity, and polish or smoothness to positive; pressure on many crystals will produce opposite electricities, as will also heat (as in tourmaline), and even the slight adherence which a piece of glazed taffeta would have to an isolated metallic plate which it covers is sufficient to give the plate negative electricity, which is the more remarkable from the fact that the friction of the two would have made the taffeta negative and the plate positive.

Moreover, both the electricities are produced in most of the chemical compositions and decompositions, in the sudden fracture of substances, in evaporations, &c.; and the higher reaches of the air are in a state of positive electricity when unoccupied by clouds, which are found indifferently charged with either.

When a body is positively electrised, we can procure the negative electrisation of another conducting substance by the influence of the former on the neutral electricity of the latter. Let the conductor be placed in the vicinity of the influencing body, but not so close as to receive any positive electricity by sparks or other direct communication. The natural electricities of the conductor will be then separated by the influence of the positively electrised body, towards which the negative electricity must be attracted and the positive repelled; the part of the conductor nearest the influencing body must therefore be covered with negative electricity, and that more remote with positive. If now this end of the conductor be made to communicate with the ground, the positive electricity will escape into this great reservoir, and moreover sufficient negative electricity will be communicated from the ground to the conductor to render the point of contact neutral: thus the conductor acquires a double charge of negative electricity, and when isolated will be found negatively electrised after it has been removed from the vicinity of the isolating body.

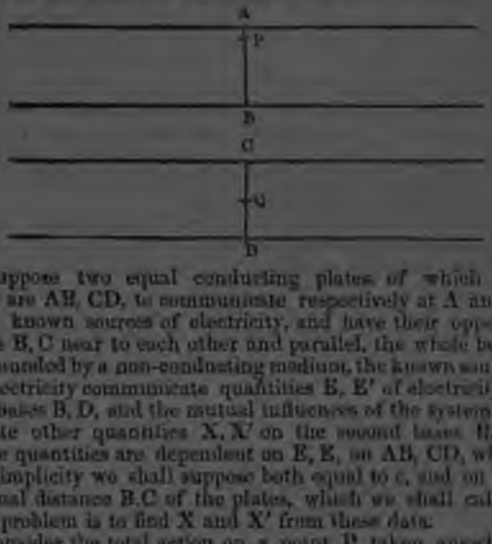
The effects of influence, as above described, may be easily observed in the following manner: Place a long and narrow isolated conducting cylinder before a body strongly electrised, and from different equi-distant points of the cylinder suspend pairs of pith-balls by cotton threads, which will acquire the electricities of the parts of the cylinder with which they are connected. We shall observe a considerable divergence in the pair suspended nearest the influencing body, because they are strongly charged with an electricity of a contrary nature to that of the body: going along the cylinder the divergence diminishes, and at a point not so remote as the middle of the cylinder there will be no divergence. Beyond this neutral line the cylinder has an electricity of the same kind as the influencing body, increasing in intensity towards its farthest extremity, and therefore the pith-balls commence to diverge more and more as we approach that end. In making this experiment a single pair of pith-balls moved along the cylinder will be sufficient if we secure them from the direct influence of the body by a pane of glass interposed near them.

This is the direct influence the electrised body has on a neutral body, but the neutral body must again re-act on the original body, sensibly decomposing its electricity if it be a conductor; and thus the true arrangement of the electricity, in two surfaces influencing each other, although instantaneously effected, may be regarded as the final effect of a succession of direct and reflected influences between the bodies. This principle has been shown by Mr. Murphy materially to facilitate the actual calculation of the distribution of electricity on two electrised surfaces in presence of each other.

The effect of the influence of a near electrised cloud has been felt by several persons; among others by the writer; and in many cases fatal results have followed, not from the direct discharge of the electricity or, as it is called, the lightning, but from the sudden reunion of the electricities which had been separated by influence, and which, upon the discharge of the cloud, is effected by means of a corresponding electric charge brought through the body from the ground.

From the power of separation of the neutral fluid in bodies at a distance which is exercised by electricity, an easy means has presented itself by which a much greater quantity of electricity may be collected upon a conducting plate than that which could be directly communicated by a conductor. We shall therefore now endeavour to explain the principle of the condenser, which we think very inaccurately stated in Biot's *Physique*, in which the subject of electricity is treated, generally speaking, in a very luminous manner.

The following investigation the author of this article gives, on his own responsibility, with the desire of placing the power of the condenser on its true basis:—



Suppose two equal conducting plates of which the axes are AB, CD, to communicate respectively at A and D with known sources of electricity, and have their opposite faces B, C near to each other and parallel, the whole being surrounded by a non-conducting medium, the known sources of electricity communicate quantities E, E′ of electricity to the bases B, D, and the mutual influences of the system generate other quantities X, X′ on the second bases B, C; these quantities are dependent on E, E, on AB, CD, which for simplicity we shall suppose both equal to c, and on the mutual distance B.C of the plates, which we shall call a. Our problem is to find X and X′ from these data.

Consider the total action on a point P, taken anywhere within the first plate and on its axis; this must be equal to zero, in order that the neutral electricity at that point may not be further decomposed. Let $PB = z$.

The action arising from the base A and the adjoining portion of the sides of the plate included between A and a parallel drawn through P is $E f(c-z)$; the form of the function f is unknown, since it depends on the law of the distribution of the fluid at the different parts of the base and sides.

Similarly, the action arising from the base $B = X f(z)$

.. .. $C = X' f(a+z)$

.. .. $D = E' f(a+c+z)$.

Our first equation of condition must therefore be—

$$X f(z) + X' f(a+z) - E f(c-z) + E' f(a+c+z) = 0 \ldots (1);$$

and if we consider in precisely the same way the equilibrium of a point Q within the second plate and in its axis, we obtain (putting $CQ = z'$)—

$$X' f(z') + X f(a+z') - E' f(c-z') + E f(a+c+z') = 0 \ldots (2).$$

The equations (1) and (2) must hold true for all values of z and z' between 0 and c, and they serve to determine the form of the function and the values of X, X′.

If the bases were infinite, $f(z)$ would be constant. (*Principia*, book xiv.)

Now $f(z)=f(o)+f'(o).z+f''(o).\frac{z^2}{1.2}+$&c. by Maclaurin's Theorem $=f(o)\left\{1+n\frac{z}{c}\right\}$ nearly;

for z being very small, we reject the powers higher than the first, and put $\frac{n}{c}$ for abridgment, instead of $\frac{f'(o)}{f(o)}$; c is introduced for homogeneity.

We may observe that n is necessarily a very small fraction in the actual case; for it depends on $\frac{c}{R}$, R being the linear dimension of the base, and it vanishes when R is infinite.

The equations may be thus simplified; and dividing them by $f(o)$ they become—

$$X+X'\left(1+\frac{na}{c}\right)-E(1+n)+E'\left(1+\frac{na}{c}+n\right)$$
$$+\frac{nz}{c}(X+X'+E+E')=o\ldots.(3)$$
$$X'+X\left(1+\frac{na}{c}\right)-E'(1+n)+E\left(1+\frac{na}{c}+n\right)$$
$$+\frac{nz'}{c}(X+X'+E+E')=o\ldots.(4).$$

Hence, by subtraction and dividing by $\frac{na}{c}$, we obtain—

$$X'+X+(E'-E)\left(1+\frac{2c}{na}+\frac{2c}{a}\right)+\frac{z-z'}{a}(X+X'+E+E')$$
$$=o\ldots.(5).$$

Since $z-z'$ may be positive, negative, or zero, and yet this equation always true, we must have separately—

$$\left.\begin{array}{l} X'-X=(E-E')\left(1+\frac{2c}{na}+\frac{2c}{a}\right) \\ X'+X=-(E+E') \end{array}\right\}\begin{array}{l}\ldots.(6)\\ \ldots.(7)\end{array}$$

It will be useful to make a few remarks before proceeding further. The expression which we have put for the action of the plane C on P in equation (3) is in reality the action not only of that plane but also of the side of the prism or cylinder, of which the base is C and altitude CP; and a similar remark applies to the action of the plane D; therefore the total action given in that equation is too great by twice the action of the side of the prism or cylinder included between the plates B and C. For the same reasons we have a like excess in the equation (4); wherefore we have subtracted these equations, when that excess disappears; whereas, if we had added them, an error would arise, small with respect to X and X′, but comparable to E+E′.

Also, from equation (7), the apparatus would be discharged by making the two plates communicate.

In the actual case the lower plate communicates with the ground; therefore $E'=o$.

Adding now the two equations, we find—

$$X'=\frac{cE}{a}\left(1+\frac{1}{n}\right),$$

and subtracting—

$$X=-\frac{cE}{a}\left(1+\frac{1}{n}+\frac{a}{c}\right).$$

n is a very small quantity and negative, since the attractive force diminishes as the point acted on becomes more remote. Hence X is very great and positive compared with E, and it follows—

First, that the greater the extent of the plates, the less n will be, being zero when that extent is infinite; therefore the power of the condenser is increased by the extent of the surfaces being enlarged.

Second, that another source of increase of the condensing power is the diminution of a, the space occupied by the non-conducting medium interposed between the parallel conducting plates.

These results are perfectly accordant with experience.

In practice, the conducting plates are generally separated by a plate of glass or a cover of varnish, the latter being used when the electrical charge is feeble; for the attractive forces of the two opposite electricities X, X′ would be too powerful for such an obstacle if E were great, and the electricities would penetrate it, and unite; but in chemical operations, where the electricity developed is of weak tension, the diminution of a is of great advantage, the quantity of electricity acquired by the plates becoming very sensible to the electrometer. [ELECTROMETER.]

The Leyden jar is an instrument founded on these principles. A glass bottle is coated within and without with tin-foil. The conductor of an electrical machine communicates with the foil on the inside by means of a metallic rod, while the outside is in communication with the ground. The opposite electricities are therefore accumulated on the internal and external sides of the glass; hence a flash and a powerful shock is produced, when the two fluids combine, by touching the outside foil with one hand, while the conductor or chain communicating with the inside is touched by the other.

It was ascertained by Cavendish that the quantity of electricity produced in the Leyden jar, with given surface, was inversely proportional to the breadth of the glass; this completely corresponds with the results which we have above obtained by theoretical considerations.

There seems little doubt, from the experiments of Wollaston, that much of the electricity produced by the common machine is attributable to chemical action; for the best amalgam to use with the rubber is that which oxidates most readily, such as tin and zinc, and scarcely any quantity of electricity is produced if, by the nature of the amalgam, there is no sensible oxidation, or if we envelope the apparatus in a medium which will not communicate oxygen, as carbonic acid gas. As the quantity taken by the conductors is proportional, *cæteris paribus*, to their surfaces, it is usual to employ several narrow cylindrical conductors placed parallel to each other; the total surface in this case being the same as that of a single cylinder of the same length, and of which the radius would be the sum of all their radii.

The electrophorus is founded on a principle nearly similar to that of the condenser; but in this case it is the non-isolated body which acquires electricity by the influence of that which is isolated.

It should be observed that the non-conducting plates employed in the condenser and Leyden jar have a certain retentive power on the electricity, and which is of the same origin as its non-conducting faculty: hence it will happen generally in experiments that the whole of the electricity will not be discharged at once, when the opposite electricities of the two plates are made to communicate by a conductor, and frequently not after several repetitions.

The same principle of the separation of the neutral electricity of remote bodies by influence is only varied in a number of electrical machines which have been at different times constructed, such as electrical batteries, electric piles, &c. The construction of such apparatus is continually varying, as frequently from caprice as from experience. Those which are most commonly employed in laboratories will be found (by such as cannot actually see them) described in most popular treatises on electricity.

In the best conducted experiments there will be a loss of electricity, arising either from the hygrometric state of the atmosphere or the imperfect insulation of the supporters employed. When, for instance, the moist particles of vapour floating in the air come in contact with the conductor of an electrical machine, they acquire by their conducting power a small portion of the electricity developed in the conductor; being similarly electrised they are repelled; and new particles of moisture arising, repeat the same process of exhaustion, each tiny robber carrying away as much electricity, not as it can hold, but as it can hold without being itself held. The quantity thus lost in a small given time is proportional to the whole charge, and therefore the latter must diminish in a geometrical progression when the time increases in arithmetical.

For atmospheric electricity, see METEOROLOGY.

The electrical light produced in a discharge, whether in an artificial vacuum, in air, or in water, which is susceptible of decomposition by the prism, and varies its tint with the substances between which it is discharged, has been a subject of controversy among physical philosophers; but the opinion most generally received is, that it is the effect of the compression of the traversed medium, which, under such circumstances, would give out light and heat. Mr. Wheatstone has recently exhibited some ingenious experiments to show the velocity of the electric fluid, an account of which may be seen in a paper communicated to the Royal Society. Its immense velocity has been demonstrated long since by the instantaneousness of its arrival at different parts of long metallic tubes, or a series of them, such as are used in pipes for conducting gas. The chemical and other effects of electricity will be found under their proper heads.

(Biot's *Physique*, tome ii.; Pouillet, *Élémens de Physique*; Murphy's *Electricity*; Papers by Mr. Snow Harris in the *Philosophical Transactions*; Turner's *Chemistry*, 8th ed., [illegible])

ELECTRICITY, LATENT. [MOLECULARITY.]

ELECTRICITY, *Medical application of.* A supposed analogy between electricity and the nervous power has led to the employment of this agent, particularly in diseases connected with defective nervous energy, and also in cases of defective secretion, perhaps originating in a similar cause. The influence of electricity on the human system differs much according to the manner in which it is applied, the length of time during which it is continued, and the degree of intensity. It also differs in its action according as it is abstracted from, or communicated to, the individual. When applied in a moderate degree of intensity, it occasions an increase of nervous action, of sensibility and irritability, more vigorous circulation of the blood, augmented warmth, and secretion, especially cutaneous transpiration; even the vegetation of plants is much increased by electricity. When the electric principle is more intense, all these actions are heightened, often to a painful degree; while such a degree of concentration as occurs during certain atmospheric changes can occasion instant death. Death occasioned by this means is always followed by rapid decomposition of the body. The diseased states in which electricity has been found most useful are—in asphyxia, from any cause (except organic disease of the heart), but particularly from exposure to irrespirable gases; in certain rheumatic diseases; and dyspepsia, dependent on irregular or defective supply of nervous energy to the lungs and stomach. It is however much inferior to galvanism as a remedial agent in these diseases. (Wilson Philip on *the Vital Functions.*) In local paralytic affections, when of a chronic character, electricity, duly persevered with, has been found very useful: in a case of dysphagia, from paralysis of the œsophagus, the patient could only swallow when placed on a seat resting on nonconductors and electrified. In deafness and loss of sight, when directed by a competent judge, it has restored the functions of seeing and hearing. Lastly, in defective secretion, especially amenorrhœa, it has proved of service.

ELECTRO-CHEMISTRY. The effects of electricity, whether produced by the common electrical machine or the voltaic apparatus, when applied to substances with sufficient intensity, are recognised in their composition or decomposition, their fusion, phosphorescence, &c.; this class of phenomena have been successively investigated by Franklin, Priestley, Cavendish, Wollaston, Cuthbertson, Davy, Van Marum, Gay-Lussac, and Thénard, Becquerel, Faraday, &c., and form an important branch of science closely connected with the nature of chemical affinities, and called electro-chemistry.

Though the decomposition of water by common electricity was effected before Wollaston, yet the remarkable simplifications which this celebrated man introduced into every chemical subject with which he was connected accompanied his electro-chemical researches, we shall therefore confine ourselves to the description of the mode he adopted to decompose water.

Finely-pointed wires of gold or platina are introduced into capillary tubes, the glass is then heated by a lamp until it becomes soft and completely covers the metal; the uncovered part of the wire is then cut off with a sharp instrument, or else the glass may be ground away until the very point of the wire commences to project; sometimes the platina is first silvered, and when the uncovered part has been cut away, the whole is plunged in nitric acid, which dissolves the silver envelope, leaving only a very fine point of platina.

Two wires thus prepared are placed in a vessel containing water, bringing the metallic points very close to each other; one wire is now put in communication with the ground, the other with one of the conductors of an electrical machine; when the electricity of the machine is evolved, a series of sparks passes through the water between the metallic points, the water becomes decomposed into its constituent gases at the points of the wires, and being collected in glass vessels filled with water, they are found in the ratio of 2 to 1 in volume, which is the known proportion of hydrogen and oxygen combined to form water: the finer the metallic points, the greater will be this decomposition; some of those used by Wollaston were of only the 10000th of an inch in diameter.

The decomposition of æther, alcohol, oils, &c., have also been effected in nearly a similar manner, by the electrical spark, and the correct proportions of the constituent gases have invariably been obtained; the oxygen in such cases is always found at the negative pole, and the same result is obtained if we use only a single wire, and do not insulate the vessel containing the fluid operated on.

In metallic solutions the precipitate on the electrised wire shows visibly the decomposition; thus in a solution of copper if we employ a silver wire, protected by an envelope of sealing wax, when the electrical discharge is communicated we find the copper precipitated on the negative wire.

When solid substances are inclosed in tubes of glass, such as the oxides of gold, tin, &c., and a strong electrical discharge passed through them, a similar decomposition takes place, the products being deposited on the sides of the glass.

When a gas is thus to be decomposed, a glass vessel is filled with mercury, and the wires introduced; the vessel is then inverted in a reservoir of mercury, and the vacuum is sufficiently filled with the gas that the wire points project above the surface of the mercury; the discharge is then effected, and the required decomposition is produced.

Example.—Sulphuretted hydrogen. Hydrogen is disengaged, the sulphur deposited, and the volume remains unaltered.

Conversely, the composition of compound bodies from their elements in many cases is effected by the electrical spark, two volumes of hydrogen, and one of oxygen gas being introduced into a stout glass tube filled with mercury, and an electrical spark passed through them by means of the wires, water is formed, accompanied with a loud detonation, and the rising of the mercury in the tube in consequence of the diminution of volume. The instruments used for the combustion of gas are called eudiometers, the principle of their construction, particularly that of Mitscherlich, is particularly simple; the object being generally to measure the quantity of oxygen contained in air.

The electrical spark will re-light a candle which has been just blown out by the carburetted hydrogen of the smoke with the oxygen of the air, which are then easily inflamed.

When electrical sparks are transmitted incessantly through a small given portion of atmospheric air, its volume becomes compressed, and nitric acid formed. (*Phil. Trans.*, vol. 75.)

By adding oxygen, we can decompose gaseous bodies (by means of the spark) which contain hydrogen: however, it has been found that there is a limit in such mixtures, beyond which the burning will no longer take place. A table of these limits is given by Turner.

Table of mixed Gases and their Products when decomposed.

Names of the gases.	Products.
Deuto-carbonate of hydrogen	Carbon and hydrogen; volume of hydrogen double
Olefiant gas . . .	Carbon and hydrogen
Gas ammoniacal . . .	Hydrogen and *azote*; volume doubled
Phosphoretted hydrogen .	Phosphorus precipitated; volume of hydrogen unaltered
Carbonic acid gas . . .	Imperfect decomposition
Hydro-chloric acid gas . .	Hydrogen and chlorine (Henry)
Azote-protoxide . . .	Oxygen and *azote*
Nitrous gas . . .	Nitric acid and azote

A species of phosphorescence is produced in different bodies by subjecting them to the action of a powerful electrical machine. Calcareous spar, carbonate of barytes, Derbyshire bitumen, &c. become luminous by the shock, while other substances give great sparks, and do not become luminous, as mica, dry peat, plumbago, &c.

We shall now consider the electro-chemical effects of the voltaic pile. In general, if two rods of platina in communication with the poles of a voltaic battery be immersed in a saline solution, it will cause a separation of its constituent parts; when the current passes through solutions of neutral salt, coloured with vegetable blues, the part of the liquid at the negative pole is green, at the positive, red.

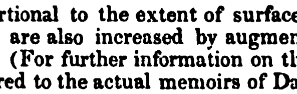
When the water contains a solution of a metallic salt, as of zinc, lead, or copper, the negative wire receives a coating of the particular metal; and in the general electro-chemical decompositions, oxygen and the oxides are found at the positive pole, hydrogen and the bases at the negative. Bodies thus susceptible of decomposition by the pile have been lately distinguished by the term electrolytes (ηλεκτρον λυω): thus hydro-chloric acid, water, &c. are electrolytes; boric acid is not such; substances are said to be electrolysable when capable of being thus decomposed. These terms have been introduced by Mr. Farady.

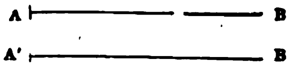
This is the place to notice the decomposition of the alcalis by means of a powerful galvanic battery. These substances had been previously taken as simple or elementary, but upon being introduced into the circuit of the battery, at the positive pole oxygen was disengaged, while at the negative pole was found the metallic base of the alcali, as sodium or potassium, according to the nature of the alcali employed; these substances burn at the temperature of the air, in oxygen or air, and are even capable of being inflamed in water. To preserve them therefore from the contact of the air, Seabeck adopted a process by which they are made to combine with mercury, in proportion as they become disengaged; the amalgam thus produced is afterwards separated by the evaporation of the mercury.

Gold-leaf, carbon, &c. placed in the voltaic current between the points of the positive and negative wires of a pile become inflamed, yielding a light of the greatest brilliancy often so intense as to be painful to the eyes.

All the chemical effects of voltaic electricity are *cæteris paribus* proportional to the extent of surface of the plates employed, and are also increased by augmenting the number of plates. (For further information on this subject, the reader is referred to the actual memoirs of Davy, Wollaston, and Faraday, in the Transactions of the Royal Society; to the *Annales de Chimie;* and to the *Traité de l'Electricité*, par Becquerel. Several isolated and interesting facts on the same subject will be found in the *Annals of Philosophy*, and the *Edinburgh Journal of Science.* See also GALVANISM.)

ELECTRO-DYNAMICS. In ordinary electricity, that fluid when developed takes a position of equilibrium, dependent on the conducting power of the medium on which it is disposed, on the non-conducting power of the medium by which it is enveloped, and on the law of force, whether of attraction or repulsion, between the elementary portions of electricty. The motions of electrised bodies are only results of the statical equilibrium of this fluid, and do not therefore belong to electro-dynamics. The mode of calculating such effects may be found under the head ELECTRICITY. These effects are moreover of the same nature whether the source of electricity be by means of friction, or by chemical action, as in the voltaic pile, the nature of the electricities in these cases differing from each other only in the mode of their production; but when the contrary, electricities are no sooner produced than re-combined, again reproduced and again re-combined, a new class of phænomena is produced belonging to electricity as it were in motion. Suppose, for example, that the plate A is a constant source of positive electricity, the plate B in like manner a constant source of negative electricity of equal intensity; that AC, BC are two conducting rods communicating with each; the electricities immediately combine when the conductors are made to touch at C, and for an instant the whole may be conceived to be in the neutral state, but A being the next instant replenished with positive and B with negative electricity, the same combination takes place over again, the same neutrality succeeds, and so on indefinitely. The rod ACB is in a different condition from one in its natural state, since electrical charges are continually pouring through it from A and B; and again it is in a different condition from an electrised rod, since we cannot at any moment say that it is charged positively rather than negatively. Hence we cannot that it should attract rather than repel an electrised D, since there is as much reason for one event as the other, and in point of fact we find that it neither will attract nor repel D. We have here a positive current of electricity issuing from A and a negative from B, and no effect of attraction or repulsion is produced on an electrised point as in statical electricity. How then is its state recognized? First by touch; for if we touch the rod ACB, a series of shocks is felt, the interval between two succeeding ones being inappreciable; and secondly, powerful chemical decomposition may be effected. [GALVANISM, ELECTRO-CHEMISTRY.] But thirdly, we may recognise it mechanically by presenting to AB another rod A′B′ under exactly similar circumstances,



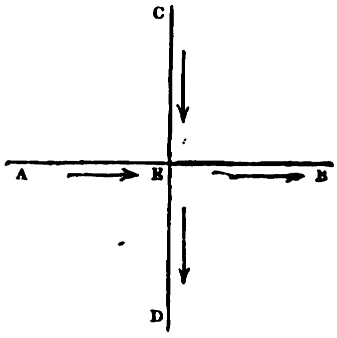


when the effects of the currents in AB, A′B′ will be recognized by the visible motions of the rods, provided they be free to move while their communication with the proper sources of electricity remains unbroken: for example, if their extremities be immersed in cups of mercury communicating with the constant sources of the positive and negative electricities. The laws of the mutual action of electrical currents constitute the science of electro-dynamics; and previous to its study it would be desirable that the reader should be acquainted with the construction and application of the galvanic apparatus, the opposite poles of which afford the two constant sources A, B of electricity which we have supposed. These will be found under the head GALVANISM.

To discover the laws of the mutual actions of electrical currents we must have recourse to experiment. An apparatus similar to that employed by Ampère will be found in Professor Cumming's translation of *Dumonferrand's treatise* on this subject; together with a description of the mode of performing the various experiments by which these laws have become known. The term *direction of a current* is convenient when speaking of more than one; for instance, the zinc end of the pile being a constant source of positive electricity and the copper end of negative, a rod communicating with wires connected respectively with these extremities will have a current of positive electricity from the zinc to the copper, and a negative current in a contrary direction; but as it is simultaneously permeated by both, when we speak of the direction of a current we shall understand that of the positive current to avoid ambiguity.

Two parallel currents which are directed in the same way attract each other, but when directed in opposite ways, they repel.

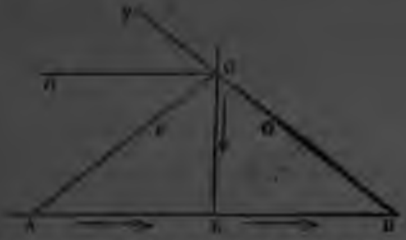
When rectilineal currents form mutually an angle, the species of action which they exercise may be thus defined: 'Two portions of currents will attract if they are both approaching or both receding from the vertex of the angle which they form; but when one approaches and the other recedes from that angle, then they repel:' the same law holds in the limiting case of parallelism.



Let two currents cross each other, as AEB, CED, and suppose the directions of the currents to be those indicated by the arrows in the figure; then, according to the law, the force between CE, EB, is repulsive; and that between CE, EA, attractive; if, therefore, AB is fixed, and CED moveable, we ought to have CE tending towards AE, and for the same reason, DE tending towards EB: the rod CED, therefore, has a rotatory motion impressed on it until it is placed parallel with AB: this is confirmed by experiment.

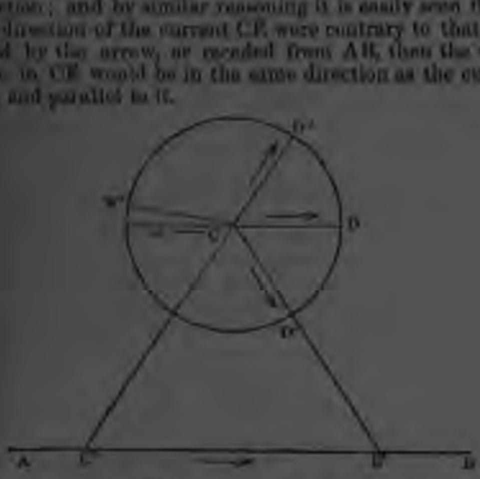
If we now consider two currents to form a very obtuse angle, one of them approaching, and the other receding from the vertex, we have repulsion; let the obtuse angle be increased to 180°, and in this extreme case the two currents merge into one; hence it follows that the consecutive parts of one and the same current exercise a mutual repulsion on each other.

The actions exercised by a rectilineal current and by a sinuous current, which have generally the same direction and are terminated at the same extremities, are equal, the intensity of action being supposed the same in both cases; thus, if we suspend a moveable conductor between a rectilineal and a sinuous conductor, disposed so as to repel the first, this, after a little oscillation about its mean place, will finally rest in the middle of the interval between the conductors.



Let us now consider the action of an indefinite current AB, on a terminated current CE, which is directed towards E; the direction of AB being that indicated in the figure.

The portion BE of the indefinite current repels EC in consequence of the contrary direction of the current in the latter. Let us represent this force in magnitude and direction by Cg = CG; also AE attracts CE; the force may be represented by CF, similarly situated with CG; but Cg, the repulsive force of BE, is drawn without the angle BEC; and CF, or the attractive force of AE, must be drawn within the angle AEC. If we now compound the forces CF, CG, they will manifestly produce a resultant CH parallel to the indefinite current AB. Hence the terminated current will be urged by a force parallel to the other, and in a contrary direction; and by similar reasoning it is easily seen that if the direction of the current CE were contrary to that indicated by the arrow, or receded from AB, then the whole force in CE would be in the same direction as the current AB, and parallel to it.



Let us suppose CD to be a conductor moveable round an axis at C in the plane DD'D'', and suppose the direction of its current to be from C towards D, and that of an indefinite conductor AB to be similar and parallel; then AB attracting CD will turn it round C into the position CD', and the force on the angle CE'B is then repulsive, and in CE'A attractive; hence CD' will further turn round, and the same direction of rotation will be continued in the upper semicircle; for the force is attractive in the angle D'''E'''B, and repulsive in D'''E'''A. Hence a continued rotation will be produced. This rotation will be in the contrary direction if we change the direction of the current either in AB or CD; or if, without changing the current, we transfer AB to the opposite side of CD: hence if AB be placed so as to meet the axis C, there will be no rotation; hence also if the terminated current be moveable round its middle point there will be no rotation, since both its halves tend to rotate in contrary ways. It is easy to analyse in the same manner the action of an indefinite conductor on a closed current by considering its action on each of the parts, the general effect being to bring the moveable conductor into a position of equilibrium in a plane parallel to the indefinite conductor.

Instead of a single closed circuit we may suppose any number of them connected together after an invariable manner. The action of an indefinite current will still tend to bring that system into a plane parallel to its direction. These systems have been called electro-dynamic cylinders, and also canals of currents.

In consequence of the electro-chemical causes which are so widely diffused through the globe, electrical currents are generated, which give its polarity to the magnet, and which, as is well known, are sufficient to generate continued rotation of given currents.

It has been found by Ampère that the actions of similar conductors on points similarly situated are equal; and that a closed conductor exercises no action on a circular conductor moveable round a central axis.

In seeking for the true laws of elementary action of currents, a decomposition similar to that of the parallelipiped of forces may be employed; that is, *for the action of an elementary current we may substitute the actions of the three sides of a parallelipiped terminated at the same extremities*; for, as before stated, if we preserve the direction of the currents we shall not alter the action by substituting any sinuous for a plane conductor with the same extremities.

We will now show how the law of force between the elements of currents may be obtained, which, when once known, will reduce all the phenomena to mathematical calculation.

To determine the law of force tending to or from any element of an electrical current, when points of another current are taken at different distances but in a given direction:—

Let δs, $\delta s'$ be the elements of two electrical currents, of which the intensities are i, i', their distance a unit, and f the force mutually exercised in the line forming their middle points; hence $f = ii' \delta s \, \delta s'$.

Let $\delta \sigma \, \delta \sigma'$ be portions of similar currents to the former, but of which the linear dimensions are ν times as great, and since their mutual distance is also ν times as great; this force is diminished in proportion to some function of ν, as $\phi(\nu)$: hence $f' = ii' \delta\sigma . \delta\sigma' . \phi(\nu)$.

$$\text{Now } \delta\sigma = \nu \, \delta s \qquad \delta\sigma' = \nu \, \delta s'; \text{ therefore}$$
$$f' = ii' \nu^2 \delta s \, \delta s' . \phi(\nu).$$

$$\text{Hence } \frac{f}{f'} = \frac{1}{\nu^2 \phi(\nu)}$$

We should have the same proportions if, instead of elements, we took conductors of any lengths but still similar, for this is equivalent merely to integrating the above expressions after decomposing the forces in fixed directions; and since we have experimentally in this case $f = f'$, it follows that $\phi(\nu) = \frac{1}{\nu^2}$; that is, the law is the inverse square of the distance, as in statical electricity; but we must observe that the directions of the currents are here supposed to make given angles with the joining line r.

The following theorems are taken from Mr. Murphy's 'Electricity,' to which we refer for the demonstrations, which are by no means difficult to persons a little acquainted with the differential and integral calculus.

Let a right line r join the middles of the elements δs, $\delta s'$ of two currents, being inclined respectively to these elements at the angles θ, θ', the planes of which angles are mutually inclined at an angle ϕ, and let ρ, ρ' be the intensities of the currents; the mutual action of these two elements will then be represented in all cases by the formula

$$\frac{\rho\rho' \delta s \, \delta s'}{r^2} \left\{ \sin\theta . \sin\theta' \cos\phi - \tfrac{1}{2} \cos\theta \cos\theta' \right\}$$
$$= \rho\rho' \delta s \, \delta s' . \frac{-\frac{1}{2}}{r} \frac{d}{ds} \left(\frac{-\frac{1}{2}}{r} \frac{dr}{ds'} \right)$$

Let R Θ, R_1 Θ_1 be the final values of r and θ for any given current of which δs is an element, $\delta s'$ remaining as before; then the total action of this electrical current on the element δs in the direction of its length will be

$$\tfrac{1}{4} \rho\rho' \delta s' \left(\frac{\cos^2 \Theta_1}{R_1} - \frac{\cos^2 \Theta}{R} \right)$$

This may be easily deduced from the preceding formula.

Hence an indefinite current, for which R, R_1 are infinite, exerts no longitudinal action on $\delta s'$; only a normal force. This coincides with what has been before shown for the action of an indefinite current on a terminated conductor. The same property holds true for a closed current, since in this case $\Theta=\Theta_1$ $R=R_1$.

From hence it is easy to find the total action of a fixed current, or a moveable rectilineal current.

The action of a closed current, or an element of another current, which is turned in all possible positions round its middle point, lies in an invariable plane.

The mutual action of two small closed conductors, containing areas λ, λ', the centres of which are at a distance ν, exercise on each other a force directly as the plane areas, and inversely as the fourth power of the distance.

The action of a uniform canal of currents indefinitely extended in one way varies inversely as the square of the distance of its extremity from the element acted on, and directly as the sine of the angle which that distance forms with the element, and is in a direction perpendicular to the plane passing through the element and the extremity of the canal.

When two uniform and indefinite canals of currents act on each other, the canals being supposed terminated at one extremity only, the resultant is in the line joining their extremities, and the force is inversely as the square of this line: hence the action of finite canals may be easily estimated, as being the difference between two indefinite canals. With respect to the nature of the force, it will be attractive or repulsive as before described. The simplest mode of observing the actions of a canal of closed currents is by twisting a wire in the form of a helix having but small intervals between the successive convolutions, the action of each portion of the helix being then very nearly the same force as that of a portion of a circle or closed current.

Ampère imagined an ingenious manner of calculating the actions of any plane closed conductors. Conceive one such to be divided into an infinity of small compartments by right lines parallel to the rectangular axes of co-ordinates, and the periphery of each compartment to be traversed by currents, in the same manner as the whole curvilineal side which encloses the area; then it is easily seen that all the internal sides of the compartments, being traversed by two currents in opposite directions, will have no electro-dynamical action, and therefore the sole remaining current is that which circulates in the periphery of the given figure; but by this division into compartments we can calculate the mutual actions of the two closed conductors from the very simple law which we have already given for the action of small closed conductors on each other.

Voltaic conductors, of which the centres of gravity are supported, undergo terrestrial action, similar to that produced by a canal of currents. We should infer, by the position which the moveable conductor takes, that the direction of the terrestrial currents is nearly from east to west, having the north magnetic pole situated on their right.

Since the action of closed currents on an element of a conductor is perpendicular to that element, hence a straight conductor fixed at one extremity, and free to move in a horizontal plane, will receive a continued rotation from the influence of the currents of the earth; but if the conductor were supported by its centre of gravity, it would be brought by their action into a fixed plane, and an electro-dynamic cylinder would come into a position perpendicular to that plane.

All these results of theory are confirmed by experiments, and are shown in the lecture-rooms of gentlemen who profess this branch of science.

There are few works expressly on this subject beside those quoted, the subject being itself the most modern addition to the exact sciences.

ELECTRO-MAGNETISM. The first important discovery in point of time, which laid the foundation of this new science, was made by Professor Oersted of Copenhagen. By reference to the article Electro-Dynamics it will be seen that when the wires which communicate with the poles of a galvanic battery are connected by a conductor or by being brought into contact with each other, the opposite electricities thus continually made to combine acquire a power of action on another conductor under similar circumstances, though latent with respect to common electrical action; but this discovery of Ampère was preceded by that of Oersted, who found that the electrical current thus generated acted upon a magnetised bar, and tended to turn it round as if exercising a tangential force. Before this time a connexion between electricity and magnetism had been suspected, or rather believed, by Franklin, Beccaria, and others, from the well-known circumstance that the poles of the compass needle had been frequently reversed during thunder-storms, and that the same effect could be produced by electric discharges. In most experiments which were then made these discharges were unnecessarily strong; but to Oersted's discovery, followed up as it has been by Ampère, Faraday, Barlow, Arago, &c., we must ascribe the source of the accurate data by which the actions of the earth on magnets, of magnets on each other, of conducting wires on magnets, and of the earth on conducting wires, are reducible to similar and simple principles of action.

When a magnetic needle is placed near a conducting wire in the plane of the magnetic meridian, and the battery is powerful, it is observed that the needle will turn round, placing itself at right angles to the direction of the current: the same effect, which we have seen in the preceding article, would be produced by the same conductor on a canal of currents. If we suppose that a man with his face turned to the needle is himself the conductor, with his feet at the positive pole, the north pole of the needle will turn towards his right. This must be understood as only meant to illustrate the direction of rotation.

In order to discover the law of action of a current on a magnetic element, Biot and Savart used a small magnetic needle, guarded from the agitations of the air, and having the action of terrestrial magnetism neutralized by a [illegible] thus subjected only to the immediate action of the conductor. Having acquired the position indicated by Oersted, the times of its small oscillations were observed, which we know by the principles of Dynamics must be inversely proportional, *cæteris paribus*, to the square root of the accelerating force impressed. By observing the times in which, for instance, ten oscillations of the needle took place, at different distances, it was deduced without difficulty, that the electro-magnetic force exercised by the whole conductor was inversely as the distance of the needle from the conductor: this of course supposes that the current may be regarded as indefinite, compared with the dimensions of the needle. Hence it easily followed, as was shown by Laplace, that the force exercised by each element of the conductor on the magnetic needle must, like all known forces, vary inversely as the square of the distance; and Biot showed that, when the distance was given, the force was also proportional to the sine of the angle formed by each element of the current with the right line joining the middle of that element with the middle of the needle.

It has been shown by means of the multiplier that the electrical intensity of the current at different points of the same conductor is constant. We may observe that the principle of the multiplier consists in bending the wire into the form of a helix, but returning upon itself so as to form a closed circuit, the wire being covered with silk to prevent communication at the crossings; the action of such a spiral being similar to that of closed circular currents equal in number to the spiral convolutions.

It was afterwards found that the magnetic needle of the multiplier could be acted on by electrical discharges from a Leyden jar; and Mr. Faraday showed conclusively that, with the condition of time, ordinary electricity can produce a continued deviation of the needle; this condition being filled by making the electricity pass through imperfect conductors.

Arago observed that small fragments of soft iron were attracted by the conductor of the galvanic pile, and the same current imparted permanent magnetism to small needles of steel. The needle should be placed perpendicularly to the joining wire or current, or, which is better, introduced in a helix, the discharge of the current through which instantaneously magnetises the needle.

Nobili observed that needles placed between the isolated spires of a plane spiral of copper wire were, by an electric discharge, magnetised in opposite ways, when near the centre and when near the circumference. Savary also observed that when needles were placed horizontally with their middle points vertical over a horizontal current, the needles perpendicular to the direction of the current, they were differently magnetised according to their distances. These experiments he has varied relatively to the length of the needles, the length and diameter of the conductor, &c.

The magnetizing force of the current is transmitted without sensible loss through isolating media, as glass, wood, &c., but is much altered by the interposition of conducting plates; a result similar to the development of ordinary electricity by the influence of electrified bodies. Thus—

A large plate interposed between the conductor and the needle weakens the magnetizing effect of feeble discharges, while it augments strong ones; and for a given charge, a thin and a broad interposed conducting plate may produce contrary effects and with a certain determinate breadth the effect would be unaltered, and in general the two surfaces of the same plate exercise contrary actions. (Savary.)

When a bar of soft iron, bent in a horse-shoe shape, is surrounded by a helix covered with silk and always turned in the same way, it may be made to receive a powerful magnetism under the influence of a current through the helix discharged from a voltaic battery. Mr. Watkins has made some valuable experiments on the conservation of the magnetic power in soft iron, for which see *Phil. Trans.*, 1833.

The discovery of the currents produced by volta-electric induction is due to Mr. Faraday. With about 203 feet of copper wire he formed each of two helices, and twisted them about a cylinder of wood, making one in communication with a galvanometer and the other with a powerful voltaic pile. The moment the communication was established, the galvanometer deviated; then, after some oscillations, returned to its place, and again deviated the instant this communication was broken: hence the directions of the inducing and induced currents are contrary, while that generated at the interruption of communication or cessation of the inducing current is directed the same way with the latter.

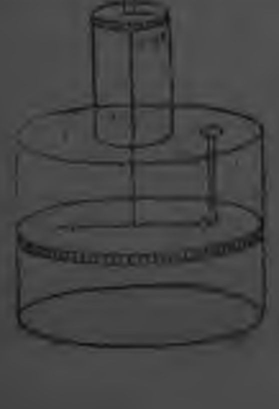
The same philosopher has also succeeded in producing currents by the influence of magnets, his experiments with the great magnets of the Royal Society proving most manifestly the disengagement of electricity by the influence of ordinary magnetism. The extraction of the electrical spark from the magnet is now pretty generally exhibited, as also the continued rotations produced by terrestrial magnetism. The theory of Ampère, which supposes electrical currents to exist round the component particles of magnetised substances, and round the mass of the earth, is perhaps the most satisfactory explanation yet given of the cause of magnetic action, and has been greatly strengthened by the discoveries of Faraday on electro-magnetic induction, by which many objections that had been urged against this theory are removed.

This branch of science is daily receiving constant accessions, and it is gratifying that much of its progress is eminently due to our countrymen. The labours of the French and German philosophers have also been far from unfruitful.

The following works may be consulted on this subject:—Gilbert's *Annalen*: *Memoirs* by Erman of Berlin, Pfaff, Hansteen, &c.; and in *Poggendorf* the papers by Seebeck, Kupffer, &c.; the recent volumes of the *Philosophical Transactions*, containing Faraday's *Researches*, Professor Cumming's *Electro-Dynamics*, and his papers in the *Annals of Philosophy*; Barlow's labours described by himself in an article of the *Encyclopædia Metropolitana*, &c.

ELECTROMETER. This term strictly applies only to instruments adapted to measure electricity; it has however been applied in a more extended sense to those which only indicate the presence of that fluid; but these are more correctly denominated electroscopes.

Of the former kind is the Balance of Torsion invented by Coulomb, to which we have had occasion to refer in the articles Electricity and Elasticity. The following is a description of this delicate instrument.



A very fine metallic wire, or, which is better, a single thread of silk taken from the cocoon, is fixed at the upper extremity, and at the lower it supports horizontally a fine needle made of a good non-conducting substance, as gum-lac, to one of the ends of which is attached the body to be electrified, as for instance a small ball of elder-pith; at the top of the suspended string there is placed a plate moveable with friction on a glass cylinder, in which the thread is contained, by which any requisite torsion may be given to the thread, which is shewn by an index on a micrometer screw; the body of the large cylinder which encloses the needle is also surmounted with a graduated brass circle. In electrical experiments the index of the micrometer is on its division zero, and the plate is turned round to bring the needle and pith-ball to the zero of the graduated circle on the string. Again a second ball is attached to the extremity of a fine isolating cylinder inserted in the apparatus so that both balls may be in contact without pressure. The balls are then electrised by communication with some insulated and electrised body, and acquiring similar electricities repulsion immediately takes place. That attached to the needle being moveable with it, carries it round through a certain angle, and after some oscillations settles at a definite position with respect to the fixed ball, this angle being indicated by the graduated arc; the elastic force of torsion is then in equilibrium with the moving force of repulsion between the balls, and hence a measure of the latter can be obtained. In such experiments only a very small electrical charge is communicated to the balls.

Coulomb, in seeking the law of electrical action, found that in the first instance of his experiment the needle deviated by 36°. Then, communicating a torsion to the thread in a direction tending to diminish this deviation, he found that the micrometer index traversed 126° to reduce the angle of deviation to 18°, and 567° of torsion was necessary to bring it to 8½°; the thread being twisted by forces applied at both ends it is evident that the entire torsions in the two latter cases are 126°+18°=144° and 567+8½=575½°, while in the first case it is only 36°. By comparing the deviations with the torsions, it was easily seen that the force of repulsion varied inversely as the square of the distance between the balls. It should be remembered in such experiments that if the torsion of the thread be too great its elasticity will act imperfectly, and be no longer proportional to the angle of torsion. (Elasticity.)

In like manner the law of attraction of differently electrised balls was ascertained, the torsion being then employed in resisting the attraction. We may observe here that the results thus deduced are necessarily approximative, and not exact, because the neutral electricity of the balls being partly decomposed by the mutual influence of the electricities communicated, the small forces thus arising interfere with the actions which should be due to the latter only. The attractive and repulsive forces may also be estimated by disturbing the needle a little from its position of equilibrium, and observing the number of oscillations which it makes in a given time, as was adopted by Biot in determining the law of electro-magnetic action of a galvanic current.

The proof-plane also used by Coulomb was merely a small disc of gilt paper fastened to an isolating handle; this he employed to discover the distribution of electricity on the surfaces of bodies by touching them with the plane at various points, and observing by means of the torsion-balance the quantity of electricity taken up by contact, which he assumed to be proportional to the quantity of electricity at the point touched. Mr. S. Harris has lately thrown doubt on the exactness of this assumption.

Various instruments have been constructed for estimating approximatively the total quantity of electricity in the charge of an electrical body, such as Lane's, Henley's, and Cuthbertson's electrometers. The most precise instrument of this description is one recently invented by Mr. Harris, who is always distinguished by the beautiful precision of his experiments; its description will be found in his paper on electricity in the 'Philosophical Transactions.'

Electroscopes indicate the presence of very small quantities of electricity, and therefore are generally used with a condenser; as the gold-leaf electroscope, consisting of two small portions of gold-leaf laid flat together, and when made to communicate by a conducting stem, with a condenser which has acquired electricity from a very feeble source, they diverge from each other. They have been also employed to indicate atmospheric electricity. [METEOROLOGY.]

Similar instruments have been constructed for the purpose of indicating the existence of electrical currents of but slight intensity, such for instance as those generated by inequality of temperature. [GALVANOMETER and THERMO-ELECTRICITY.]

ELECTRUM, from the Greek *electron* (ἤλεκτρον). Pliny says this term denotes two substances, namely, amber and a metallic alloy composed of four parts of gold and one part of silver. 'Ubicumque quinta argenti portio est *electrum* vocatur.' (*Hist. Nat.*, lib. xxxiii., section 23; *Hardouin*, tom. ii., p. 619.) The term electron, in the Odyssey of Homer, is supposed to mean amber.

The metallic electrum was in use in the Roman times: it is uncertain whether it was known to the Greeks. The Romans were partial to it for its brilliancy. Pliny, a few sentences lower down than the passage just quoted, says, 'Electri natura est ad Lucernarum lumina clarius argento splendere.' The Romans used it frequently for what we term plate.

Lampridius, in his Life of Alexander Severus, remarks, that this prince caused coins to be struck in honour of Alexander the Great, both of electrum and gold. 'Alexandri habitu nummos plurimos figuravit: et quidem electreos aliquantos: sed plurimos tamen aureos.' (*Hist. Aug. Scriptores*, p. 922.)

Isidorus, in his Origines (li. xvi., c. 23), speaks of three sorts of electrum:—1, amber; 2, a metal so called, found in a natural state; and 3, a metal compounded of three parts of gold and one of silver.

ELECTUARY, a term applied to a compound of various medicines, united by means of syrup, or wine, and formed into a soft mass, nearly of the consistence of honey. Substances in the state of powder or extract were thus combined, and rendered capable of being swallowed without their natural taste, which might be unpleasant, being perceived. Formerly electuaries consisted of a great variety of ingredients, often very unsuitable to be taken together. In the present day the few electuaries which are prescribed are much simpler in their composition. Many compounds which were formerly preserved in a soft state are now kept in a hard dry condition, and termed *confections*.

ELEDO'NE. [CEPHALOPODA; SEPIADÆ.]

ELE'GIT, so called from the entry of its award upon the roll, 'quod elegit sibi executionem' (because the plaintiff hath chosen the writ of execution), is a writ of execution given by the statute 13th Edw. I., cap. 18, to parties recovering upon judgments for debt or damages, or upon the forfeiture of a recognizance in the king's courts. It is directed to the sheriff of the county where the defendant's property lies, commanding him to make delivery of a moiety of the debtor's lands and all his goods (except oxen and beasts of the plough) to the plaintiff.

The sheriff, immediately upon the receipt of this writ, empanels a jury, who appraise the debtor's lands as well as his goods, and if the goods alone are insufficient to pay the debt, then the sheriff, upon the finding of the jury, sets out one-half of the lands by metes and bounds, and delivers them over to the party suing out the writ, who thereupon becomes what in law is termed a *tenant by elegit*, and continues to occupy them until the whole of his debt and damages are satisfied. The tenant's interest in the land is only a chattel, and as such goes to his personal representatives.

In like manner every subsequent judgment creditor takes a moiety of what is left; the last moiety being reserved according to the feudal law for the lord to distrain for his services.

Previously to the passing of the statute above referred to, a judgment creditor could only have obtained satisfaction of his debtor's goods by the writ of *fieri facias*, and of the present profits of his lands by a *levari facias;* but as the latter writ did not extend to the possession of the lands themselves, a defendant might, if he thought proper, alien the property, and thus oust the plaintiff of his remedy.

Copyhold lands are not liable to be extended under an elegit; but all estates in fee-simple in possession, all estates in reversion, expectation, leases for lives or years (in which case the creditor takes half the rents), an estate tail during the life of the tenant in tail, who is the debtor, a rent charge, and a term of years, are liable to an elegit.

When the judgment is satisfied out of the extended, that is, estimated value of the estate, the defendant may recover his lands either by an action of ejectment, or by a suit in equity. If the lands are recovered by ejectment, the plaintiff only accounts for the extended value of the land, which is usually below the real value; and he is not entitled to any interest on his judgment. If, on the other hand, a bill in equity is filed, the plaintiff is allowed interest, and accounts not merely for the extended value, but for the actual profits of the lands during his possession, and it is referred to a master of the Court of Chancery to ascertain the exact amount of such profits. (Reeves's *History of the English Law;* Archbold's *Practice.*)

ELEGY, from the Greek, *élegos* (ἔλεγος, whence ἐλεγεῖον), in English commonly means a short poem composed on some person's death; also, in a more general sense, any mournful or serious poem, as, for instance, Gray's 'Elegy in a Country Church-yard.' The Greek word, *élegos*, is properly a strain of lament; *elegeion*, the form of versification in which such strains were first composed by the Greeks; *i. e.*, the combination of an hexameter and a pentameter (commonly called long and short) verse; *elegeia*, a poem made up of such verses. (Müller, *Hist. of Lit. of Greece.*) The elegiac was the first variation from the hexametral, or epic, measure; and this change of form corresponded with a change of subject: the poet in epic composition keeping himself and the workings of his own mind out of sight; while, on the contrary, the free and full expression of the poet's feelings, as affected by external circumstances, constituted the essence of the Greek elegy. Hence arises its variety; the elegies of Callinus and Tyrtæus (the earliest) being political and warlike; of Mimnermus, contemplative and melancholy; of Theognis and Solon, moral and political, &c. It was at first more peculiarly appropriated to social meetings, and therefore equally fit for topics of political and local interest, and for those which refer to the common feelings of our nature, as love, regret for the perishableness of human things, exhortations to the enjoyment of the present hour, and the like. The elegiac was also a favourite measure for epigrams, that is, taking the word in its proper sense, inscriptions. [EPIGRAM.]

Catullus is the first Latin elegiac writer of any note: he was followed by Tibullus, Propertius, and Ovid, with many others of the Augustan age, whose poems are either totally lost, or have only come down to us in fragments. With them political and moral subjects find no place; the elegiac verses of Catullus (a small part of his poems) are, for the most part, either mournful or satirical; those of the other poets above named are chiefly devoted to love, fortunate and unfortunate. Ovid, however, has taken a wider scope of personal feelings in his Epistles from Pontus, and of historical and mythological learning in his Fasti.

ELEMI, a resin, of which there are two or more sorts, brought from different parts of the world, and apparently produced by different kinds of trees. The West Indian or American elemi is commonly referred to the Amyris elemifera (Linn.), but the very existence of such a species is doubtful, unless it be synonymous with the Amyris Plumieri. (Dec.) The East Indian elemi is obtained from the Amyris zeylanica (Retz.), while a third sort, called African or elemi verum, is referred to the Eleagnus hortensis. A substance resembling elemi, and capable of being applied to similar purposes, may be procured from several plants. West Indian elemi occurs in irregular-shaped small pieces which run into masses, of a yellowish colour, of an agreeable odour, which is most perfectly developed by the application of heat. The consistence is at first soft, but it hardens with age, and even becomes brittle, losing some of its odour. Specific gravity 1.083. It seems to contain a principle termed Elemine. Elemi is recommended as an ointment, but it is chiefly used to form pastilles, or to burn as incense.

ELEMENTARY ORGANS, in plants, are those minute internal parts out of which all the visible organs are constructed; they are always too small to be seen without the assistance of the microscope, and often require very high magnifying powers to be distinctly observed. When of a spheroidal figure 5000 of them have been sometimes computed to lie in half a square inch; and when tubular they are often not more than $\frac{1}{500}$ of an inch in diameter; their size is however extremely variable, and their magnitudes are given only to convey an idea of their smallness.

These organs may be defined to be closed, transparent, thin-sided, membranous sacs, varying in form according to the part of the plant in which they are placed, and the purpose they serve.

If for the conveyance of fluid matter equally in all directions, and for the general purposes of digestion and respiration, they have a spheroidal figure, shaped into a polygon by the pressure of the sacs upon each other, and constitute common *cellular tissue*; if fluid is to be conveyed more in one direction than another the spheroids are lengthened in that direction and *prismatical cellular tissue* is the result, or *muriform* if they are placed horizontally and strongly compressed from the sides; sometimes instead of being prismatical they are lengthened into fine points at each end, the *clostres* of some French botanists, and the tissue thus formed is named *prosenchyma*, in contradistinction to *parenchyma*, which is a collective name for all cellular tissue the ends of whose sacs are truncated. Now and then a fibre is generated spirally in the inside of a sac of cellular tissue, but for what purpose is unknown.

If the elementary organs are for the conveyance of air they are lengthened into tubes the sides of which are protected in the inside by a fibre, or fibres twisted spirally, so that the threads touch each other, thus forming a lining to the membrane and preventing the egress of fluid through the sides. Such organs are called *spiral vessels*, and are exclusively (except in a very few cases) stationed around the pith of exogens, in the woody bundles of endogens, and in the veins of the leaves and of all the parts of the flower. They unrol with elasticity when stretched; and even if they with the growth of the membranous tube in which they have been generated so as to leave spaces between the threads through which fluid percolates, they then become *ducts*, and probably cease to convey air, but become passages for fluid.

If they are required to serve the two purposes at once of conveying fluid along the plant and of strengthening and protecting the parts in which they are placed, the sacs become fine tubes, thick-sided, elastic, tough, and collected in bundles so as to bend any way without breaking; this occurs in wood, which is composed principally of them, and which gives them the name of *woody tissue*, in the liber, and in the veins of the leaves where they are placed around the spiral vessels.

For an explanation of the many varieties of the elementary organs, and for a more particular account of their nature and uses, see Lindley's *Introduction to Botany*, 2nd edit., book i.

ELENCHUS, the Latin form of the Greek *elenchos* (ἔλεγχος), and commonly translated by the words *argumentum*, *argumentatio*, *confutatio*, and *demonstratio*, is a term of frequent use in the Aristotelian system of logic, and signifies argument, replication, refutation, or the point, subject, or nature, of dispute or demonstration. (See the authorities cited in Valpy's edition of Stephens's Greek Thesaurus under 'Ἔλεγχος.') Aristotle defines *elenchus* as 'a syllogism of contradiction,' that is, an argument alleged in opposition to another; and Mr. Thomas Taylor, in his translation of the Organon, considers the Greek term to be precisely equivalent to *Redargutio* in Latin. By some of the early English authors the noun *elench* is used in a similar sense, and also the verb *elenchize*, meaning to argue with captious or sophistical opposition. (Johnson's *Dict.*) In the two last books of the Organon, entitled Περὶ τῶν Σοφιστικῶν Ἐλέγχων, Aristotle minutely classifies and distinguishes the various kinds of sophistical elenchi, or modes of argument used by contentious sophists. The sophism which, in scholastic phraseology, is designated *Ignoratio elenchi*, that is, a real ignorance of, a mistaking, or sinister deviation from, the argument, or question under discussion, consists in proving something irrelevant, and which, as it may be true without affecting the truth of the real proposition, with which it has no necessary connexion, does not determine, though it may seem to determine, the question. Aristotle includes under this designation the introduction of everything extraneous to the point in dispute (ἔξω τοῦ πράγματος), the disproving of what is not asserted, as well as the proving of what is not denied. Examples of this species of sophism are of very frequent occurrence in discourses which display the rhetorical artifice of appealing to passions and prejudices, and resort to injurious imputations, or ludicrous and satirical illustration; generally in religious, political, and forensic disputations, which affect individual interests and feelings, and in which the predominant desire is not the exhibition of truth, but merely the obtaining of victory; for a disingenuous disputant, when assailed, and conscious of the superiority of his adversary's argument, strives to elude conviction by the stratagem of *deploying*, and seeks to gain a sinister advantage and triumph, by proving or disproving, not the real proposition in question, but one or more which in some way are apparently involved or implied, so as to create the assumption of identity. The following instance is given by Dr. Kirwan (*Essay on Logic*, vol. ii., p. 440): 'Pascal arguing against atheism insists that it is *more dangerous* than theism, whereas the point in debate is the *truth*, and not the *prudence* of either system.' Some Christian sects use similar arguments. Mistake or misrepresentation of the question to be determined, and the consequent proving of what is not to the purpose, are also common in didactic and conversational discussions, and the sophisms of *Petitio principii* and *non causa pro causa* are frequently combined with the *Ignoratio elenchi*. In all cases of irrelevant conclusion, when something is proved which does not in reality contradict the adversary's proposition, the latent fallacy is best exposed by showing that both propositions may be equally true (Archbishop Whately's *Logic*, p. 235, 5th ed. 1834); and the best means of preventing sophistical deception of this nature is to keep the attention constantly fixed upon the precise point of dispute, neither wandering ourselves, nor suffering our opponent to wander or make any substitution. (Dr. Watts's *Logic*.) In dramatical writing the *Ignoratio elenchi*, or as it is otherwise called, the *quid pro quo*, is frequently adopted as a very effective expedient for the production of laughter. Numerous and long continued instances of consistent dialogue, displaying the most ingenious and amusing *équivoque* or cross-purposes, are to be found in the comedies of Molière, the source of amusement being in each party's 'ignorance of the question' about which the other is concerned.

ELEPHANT, in Latin *Elephas* and *Elephantus*; in Greek Ἐλέφας; in Spanish *Elephante*; in Italian *Elefante*; in French *Elephant*; in German *Elephant*; the name of the well-known genus which forms the only living type of the family of *true Proboscidians* or Pachydermatous Mammifers, with a proboscis and tusks, and presents the largest of existing terrestrial animals.

The *proboscis* or *trunk*, from which the name of the family is derived, demands some attention previous to our inquiry into the rest of the structure, habits, and history of the elephants.

The great size of the alveoli necessary for the lodgment of the tusks renders, as Cuvier observes, the upper jaw so high and shortens the nasal bones to such a degree, that in the skeleton the nostrils are placed towards the upper part of the face; but in the living animal they are prolonged into a cylindrical trunk or proboscis composed of thousands* of small muscles variously interlaced, so as to bestow on it the most complicated powers of mobility in all the varieties of extension, contraction, and motion in every direction. It is of a tapering subconical form, and has internally two perforations. On the upper side of the extremity, immediately above the partition of the nostrils, is an elongated process, which may be considered as a finger; and on the under edge is a sort of tubercle, which acts as an opposable point; in short, as a thumb. Endowed with exquisite sensibility, nearly 6 ft. in length, and stout in proportion to the massive size of the whole animal, this organ, at the volition of the elephant, will uproot trees or gather grass—raise a piece of artillery or pick up a comfit—kill a man or brush off a fly. It conveys the food to the mouth and pumps up the enormous draughts of water, which by its recurvature are turned into and driven down the capacious throat, or showered over the body. Its length supplies the place of a long *neck*, which would have been incompatible with the support of the large head and weighty tusks. A glance at the head of an elephant will show the thickness and strength of the trunk at its insertion; and the massy arched bones of the face and thick muscular neck are admirably adapted for supporting and working this powerful and wonderful instrument.

The following cuts will convey some idea of the form and action of the termination of the proboscis:—

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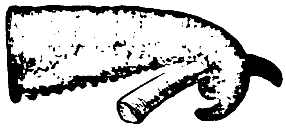
* Cuvier gives the number of muscles having the power of distinct action as [illegible]

Anterior termination of elephant's trunk (profile).

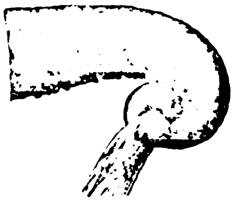
Anterior extremities of the trunks of male (A) and female elephants (B).

Action of anterior extremity of proboscis in gathering long herbage.

Mode of holding herbage when gathered.



Mode of holding a root till enough is collected for a mouthful.



Curled action, when a powerful grasp and much force is required.

Dental Formula.—African elephant, incisors $\frac{2}{0}$, molars $\frac{4}{4}=10$. Asiatic elephant, incisors $\frac{2}{0}$, molars $\frac{2}{2}=6$.

Dentition and osseous Structure.—The succession of *molar teeth* in the elephants takes place in a direction from behind forwards: and the tooth last developed pushing against that which preceded it, and in time replacing it, gives as a result that there are never more than two molar teeth on each side of each jaw, and that sometimes there is only one. The last case happens immediately after the shedding of the anterior tooth, which has been pushed out by its successor, and which, in its turn, is to be replaced in like manner. This succession happens many times during the life of the animal, and Mr. Corse noticed it eight times in an Asiatic elephant. Now, as these teeth show their anterior extremity first, long before the other extremity appears, and as they begin to be worn down anteriorly, it follows that the anterior tooth, when it is shed, is infinitely smaller in size than it once was, and that its form is entirely changed.

In the molar teeth of most graminivorous quadrupeds there is, besides the bony substance and enamel, a third component part, differing in appearance from both the others, but resembling the bone more than the enamel. Blake and others have distinguished this substance by the name of *crusta petrosa*; Cuvier calls it *cement*. The distinction of these three substances is, perhaps, better seen e molar tooth of an elephant than in any other animal. If a longitudinal vertical section be made and the surface be polished, the *crusta petrosa* will be distinguished by a greater yellowness and opacity, as well as by a uniformity of appearance, there being no apparent laminæ nor fibres. 'The grinding teeth of the elephant,' writes Lawrence in his 'Additions' to Blumenbach, 'contain the most complete intermixture of these three substances, and have a greater proportion of *crusta petrosa* than those of any other animal. The pulp forms a number of broad flat processes lying parallel to each other, and placed transversely between the inner and outer laminæ of the alveoli. The bone of the tooth is formed on these in separate shells, commencing at their loose extremities and extending towards the base, where they are connected together. The capsule sends an equal number of membranous productions, which first cover the bony shells with enamel and then invest them with *crusta petrosa*, which latter substance unites and consolidates the different portions. The bony shells vary in number from four to twenty-three, according to the size of the tooth and the age of the animal; they have been described under the name of denticuli, and have been represented as separate teeth in the first instance. It must, however, be remembered that they are formed on processes of one single pulp. When the *crusta petrosa* is completely deposited, the different denticuli are consolidated together. The bony shells are united at the base to the neighbouring ones; the investments of enamel are joined in like manner, and the intervals are filled with the third substance, which really deserves the name bestowed on it by Cuvier of *cement*. The pulp is then elongated for the purpose of forming the roots or fangs of the tooth. From the peculiar mode of dentition of this animal, the front portion of the *tooth* has cut the gum and is employed in mastication before *the* back part is completely formed; even before some of the posterior denticuli have been consolidated. The back of the tooth does not appear in the mouth until the anterior part has been worn down even to the fang. A horizontal section of the elephant's tooth presents a series of narrow bands of bone of the tooth, surrounded by corresponding portions of enamel. Between these are portions of crusta petrosa, and the whole circumference of the section is composed of a thick layer of the same substance. A vertical section in the longitudinal direction exhibits the processes of bone upon the different denticuli, running up from the fang. A vertical layer of enamel is placed before and another behind each of these. If the tooth is not yet worn by mastication, the two layers of enamel are continuous at the part where the bone terminates in a point; and the front layer of one denticulus is continuous with the back layer of the succeeding one, at the root of the tooth. Crusta petrosa intervenes between the ascending and descending portions of enamel. As the surface of the tooth is worn down in mastication, the processes of enamel, resisting by their superior hardness, form prominent ridges on the grinding surface, which must adapt it excellently for bruising and comminuting any hard substance. The grinding bases, when worn sufficiently to expose the enamel, in the Asiatic species, represent flattened ovals placed across the tooth. In the African they form a series of lozenges, which touch each other in the middle of the tooth.' In the Museum of the Royal College of Surgeons are a series of preparations (Nos. 350 to 354, both inclusive) illustrative of the structure and physiology of the molar teeth of elephants, preceded by an interesting extract from the Hunterian catalogue. No. 375 B. is a portion of the cæmentum of an elephant's grinder, which has been steeped in an acid, and preserved in oil of turpentine, for the purpose of showing the proportion of animal matter which it contains.

Nos. 262 to 264, both inclusive, show the interarticular ligamentous substance from the joint of the lower the elephant, and the adaptation of the structure for applying two convex surfaces to each other.

More than one molar tooth and part of another are to be seen through the gum in the elephant. When the anterior tooth is gradually worn away by mastication, absorption of its fangs and alveolus takes place, while the posterior tooth advances to occupy its position; then a third to take the place of the second tooth, which undergoes the same process, and so on as we have stated at least eight times. Each succeeding tooth is larger than its predecessor. Thus the first or milk grinder, which the gum soon after birth, has but four transverse (denticuli); the second is composed of eight or nine, a appears completely when the animal is two years old; the third consists of twelve or thirteen, and comes at the age of six years; and in the fourth up to the eighth grinder both inclusive the number of plates varies from fifteen to twenty-three. It would seem that every new tooth takes at least a year more for its formation than its predecessor. As the tooth advances gradually, a comparatively small portion only is through the gum at once. A molar tooth, composed of twelve or fourteen plates, shows only two or three of these through the gum, the others being imbedded in the jaw, and in fact the tooth is complete anteriorly, where it is required for mastication, while, posteriorly it is very incomplete. As the laminae advance, they are successively perfected. An elephant's molar tooth is therefore never to be seen in a perfect state; for if it is not worn at all anteriorly the posterior part is not formed, and the fangs are wanting; nor is the structure of the back part of the tooth perfected until the anterior portion is gone.

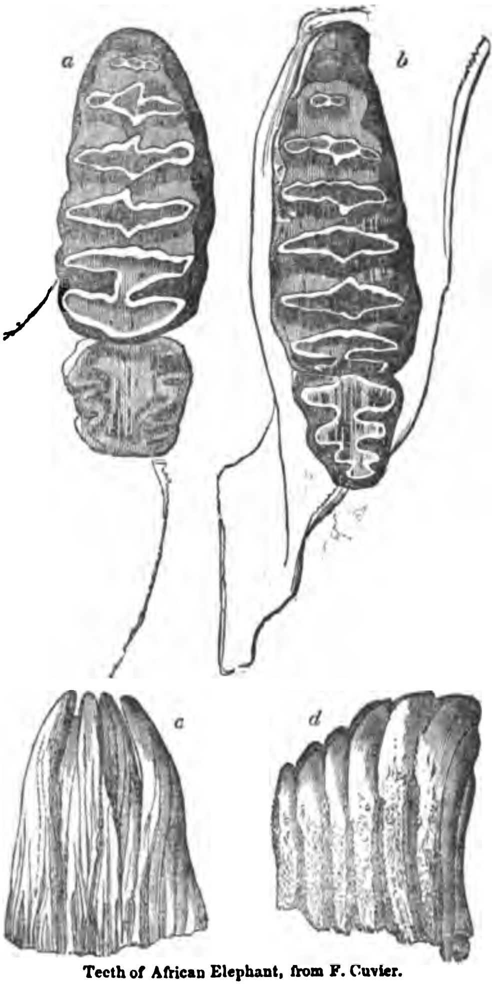
Elephants have no canine teeth; but in the upper jaw there are two incisors better known by the name of *tusks*. These enormous weapons are round, arched, and terminating in a point, and their capsule is always free, so that the tusk continues to grow as long as the animal lives. The structure of the ivory of which it is composed differs from other tusks; and a transverse section presents striae forming the arc of a circle from the centre to the circumference, and, by crossing each other, curvilinear lozenges which occupy the whole surface. The tusk is hollow within for a great part of its length, and the cavity contains a vascular pulp, which supplies successive layers internally as the tusk is worn down externally. Blumenbach, in his 'Comparative Anatomy,' observes, that not to mention other peculiarities of ivory, which have induced some modern naturalists to consider it as a species of horn, the difference between its structure and that of the bone of teeth is evinced in the remarkable pathological phenomenon resulting from balls, with which the animal has been shot when young, being found, on sawing through the teeth, imbedded in its substance in a peculiar manner. Haller employed this fact, both to refute Duhamel's opinion of the formation of bones by the periosteum, like that of wood by the bark of a tree, as well as to prove the constant renovation of the hard parts of the animal machine. It is still more important in explanation of that '*nutritio ultra vasa*,' which is particularly known through the Petersburgh prize dissertation. Blumenbach further states that the fact above mentioned may be seen in Buffon ('*Hist. nat.*,' tom. xi., p. 161); in Camper ('*Descr. de Elephantis Dentibus*,' in the Verhandelingen der Genootsch. te Vlissingen, p. 352, tom. ix.); and in Bonn ('*Descr. thesauri Hoviani*,' p. 148). In all these cases, according to Blumenbach, the balls were of iron; and he adds that he possesses a similar specimen. In the cases we have seen the balls were also of iron. 'But,' continues Blumenbach, 'there is a still more curious example in my collection, of a leaden bullet contained in the tusk of an East Indian elephant, which must have been equal in size to a man's thigh, without having been flattened. It lies close to the cavity of the teeth; its entrance from without is closed, as it were, by means of a cicatrix; and the ball itself is surrounded apparently by a peculiar covering. The bony matter has been poured out on the side of the cavity in a stalactitic form.' Upon this Lawrence well remarks that the facts here recounted have been sometimes brought forward in order to prove the vascularity of the teeth; a doctrine which is refuted by every circumstance in the formation, structure, and diseases of these organs. When a bullet has entered the substance of the body, the surrounding lacerated and contused parts do not grow to the metal and become firmly attached to its surface, but they inflame and suppurate in order to get rid of the offending matter. If the ivory be vascular, asks Mr. Lawrence, why do not the same processes take place in it? 'We can explain very satisfactorily,' writes Mr. Lawrence in continuation, 'how a bullet may enter the tusk of an elephant, and become imbedded in the ivory without any opening for its admission being perceptible. These tusks are constantly growing during the animal's life by a deposition of successive laminae within the cavity, while the outer surface and the point are gradually worn away; and the cavity is filled for this purpose with a vascular pulp, similar to that on which teeth are originally formed. If a ball penetrate the side of a tusk, cross its cavity, and lodge in the slightest way on the opposite side, it will become covered towards the cavity by the newly-deposited layers of ivory, while no opening will exist between it and the surface to account for its entrance. If it have only sufficient force to enter, it will probably sink by its own weight between the pulp and the tooth, until it rests at the bottom of the cavity. It there becomes surrounded by new layers of ivory; and as the tusk is gradually worn away and supplied by new depositions, it will soon be found in the centre of the solid part of the tooth. Lastly, a foreign body may enter the tusk from above, as the plate of bone which forms its socket is thin: if this descends to the lower part of the cavity it may become imbedded by the subsequent formation of ivory. This must have happened in a case where a spear-head was found in an elephant's tooth. The long axis of the foreign body corresponded to that of the cavity. No opening for its admission could be discovered, and it is very clear that no human strength could drive such a body through the side of a tusk.' 'Phil. Trans.' 1801, part i.

The great size to which these tusks grow may be judged of by examining the table published by Cuvier in his 'Ossemens Fossiles,' tome i., p. 57. It is generally considered that the tusks of the African elephant are the largest; but with regard to the table, Cuvier observes that the African tusks could not be distinguished from those of the Indian, and that there is not the certainty that could be wished in the measures employed. According to Mr. Corse, the tusks of the Indian elephant seldom exceed 72 lbs. in weight, and do not weigh beyond 50 lbs. in the province of Tipperah, which produces thousands of elephants. There are however, in London, tusks which weigh 150 lbs., probably from Pegu; for it is from Pegu and Cochin China that the largest Indian elephants and tusks are brought. The largest recorded in Cuvier's table was a tusk sold at Amsterdam, according to Klokner, which weighed 350 lbs.; this is stated on the authority of Camper; and one possessed by a merchant of Venice, which was 14 feet in length, and resting on the authority of Hartenfels, in his Elephantographia. The largest in the Paris Museum is nearly 7 feet long, and about 5½ inches in diameter at the large end. These tusks have different degrees of curvature.

Mr. Corse, speaking of the Asiatic elephant, states that the first or milk tusks of an elephant never grow to any size, but are shed between the first and second year. These, as well as the first grinders, are named by the natives *dood-kau-daunt*, which literally signifies milk teeth. The tusks which are shed have a considerable part of the root or fang absorbed before this happens. The time at which the tusk cuts the gum seems to vary. Mr. Corse knew a young one which had his tusks when about five months old, while those of another did not cut the gum till he was seven months old. These tusks, which are deciduous, observes the same author, are perfect and without any hollow at the root, in a foetus which is come to its full time; and at this period the socket of the permanent tusk begins to be formed on the inner side of the deciduous tusk. He gives the following examples of the progress of this part of the dentition. A young elephant shed one of his milk tusks on the 6th of November, 1790, when near thirteen months old, and the other on the 27th of December, when about fourteen months old: they were merely two black-coloured stumps, when shed; but, two months afterwards, the permanent tusks cut the gum, and on the 13th of April, 1791, they were an inch long, but black and ragged at the ends. When they became longer and projected beyond the lip, they soon were worn smooth by the motion and friction of the trunk. Another young elephant did not shed his milk tusks till he was sixteen months old. The permanent tusks of the female are very small in comparison with those of the male, and do not take their rise so deep in the jaw; but they use them as weapons of offence in the same manner as the male named *Mooknah*, that is by putting their head above another elephant, and pressing their tusks down into the animal.

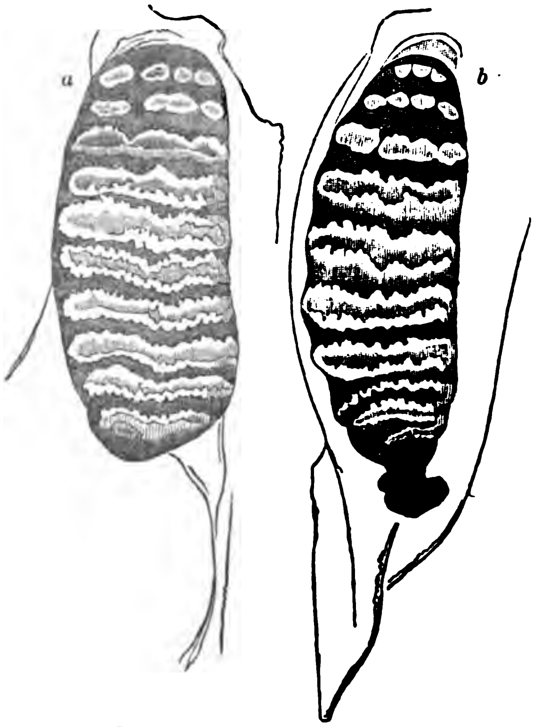
In the *lower jaw* there are neither incisors nor canines, and the molar teeth resemble those to which they are opposed.

Cuvier comes to the conclusion that the females of the African species have large tusks, and that the difference between the sexes in this respect is much less than in the Indian elephants; but Burchell attributes the want of success of the elephant hunters whom he met with to their having only fallen in with females whose tusks were small.



Teeth of African Elephant, from F. Cuvier.

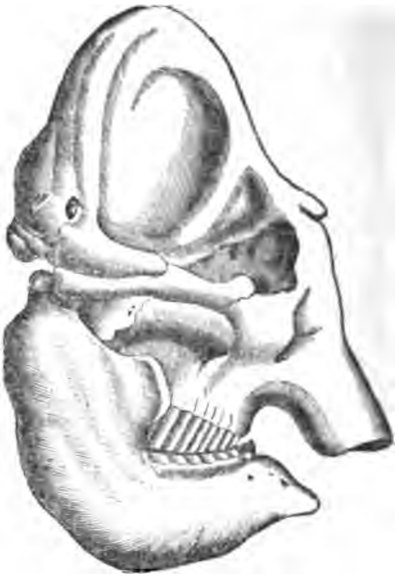
a, Upper jaw; *b*, lower jaw; *c*, original state of the tooth when the laminæ which compose it are free; *d*, the laminæ as they are attached in parallels one to the other by the cortical substance in a subsequent state of dentition, but before the crown of the tooth has been worn by mastication, and when it only presents on its surface blunt tubercles.



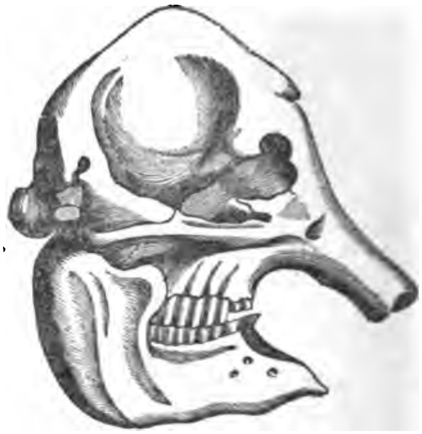
Teeth of Asiatic Elephant, from F. Cuvier.

a, Upper molar tooth; *b*, lower molar tooth.

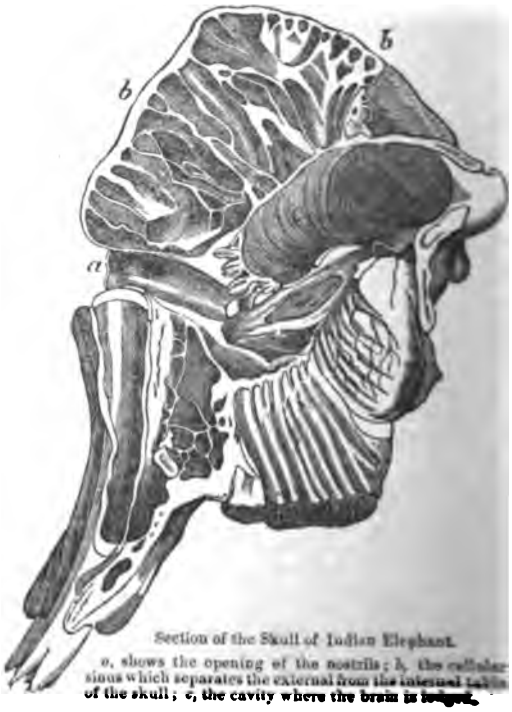
Pursuing our inquiry into the **general structure of the *skeleton***, we shall find a marked difference in the external appearance of the ***skulls*** of the African and Indian species.



Skull of Indian Elephant.



Skull of African Elephant.



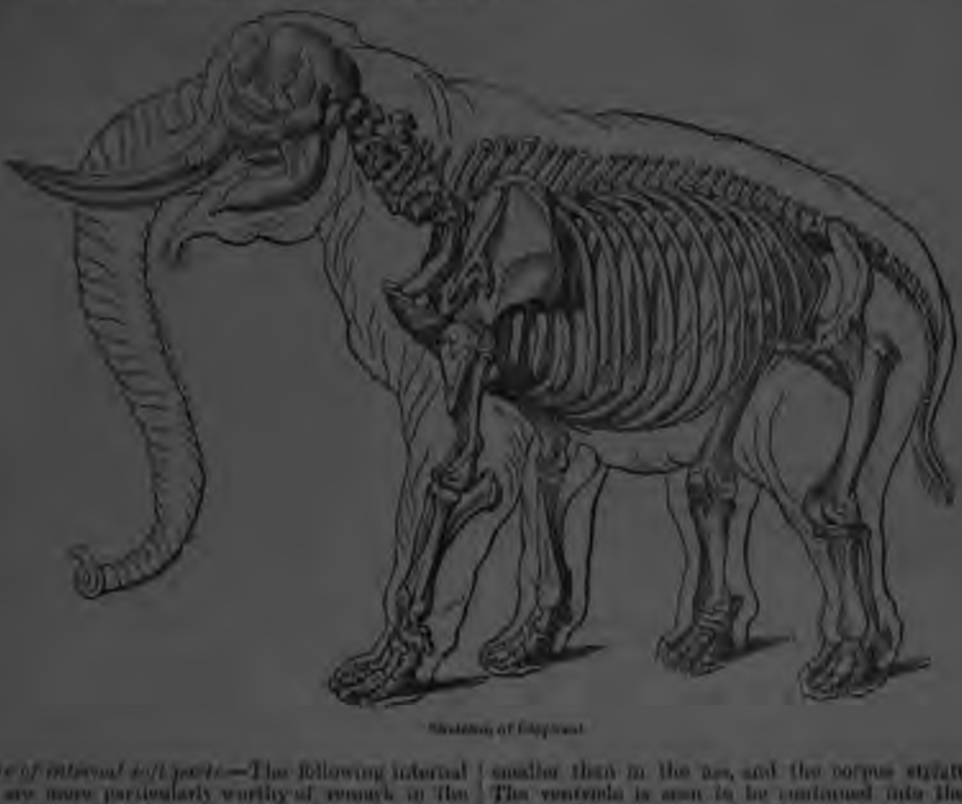
Section of the Skull of Indian Elephant.

a, shows the opening of the nostrils; *b*, the cellular sinus which separates the external from the internal table of the skull; *c*, the cavity where the brain is lodged.

Here we see that the almost pyramidical form of the skull in the Indian species is strongly contrasted with the more rounded form and contour of that of the African species. The front of the head is concave in the Indian species, while in the African it is rather convex; there are besides other differences.

Internally we find a beautiful provision for increasing the surface necessary for the attachment of muscles combined with strength and lightness.

The other parts of the skull most worthy of note are the nasal bones, of which the elephant possesses only a kind of imitation; the lachrymal bones are entirely wanting. The cervical vertebræ form a short and stiff series, allowing hardly more than a limited motion of the head from side to side, a more extended action being rendered unnecessary by the flexibility of the trunk, and a firm support for the head being the principal object to be attained. The spinous processes of the anterior dorsal vertebræ are exceedingly long for the attachment of the great suspensory ligament of the neck (*ligamentum nuchæ* or pax-wax). Blumenbach puts the number of ribs, and consequently of dorsal vertebræ, at 19 pairs, observing that this, at least, is the case in the skeleton of the Asiatic elephant at Cassel. Blair, he remarks, found the same number in the individuals of which he has given an account; and a manuscript Italian description of the elephant which died at Florence in 1657 confirms this statement. Allen Moulins, on the contrary (*Anatomical Account of the Elephant burned in Dublin*, London, 1682, 4to.) and Daubenton, represent the number of pairs as 20. The elephant in the Museum of the Royal College of Surgeons (Chunee, formerly of Exeter Change) has 19 pairs of ribs; and that in the British Museum has the same number, 14 true and 5 false; but Mr. Gray informs us that, in a second specimen of a young one, the bones of which have not been separated, there are 20 pairs, 15 true and 5 false. There are only three lumbar vertebræ. The margin of the scapula, which is turned towards the spine, and is shortest in most of the proper quadrupeds, is the longest in the elephant, as it is in the *Cheiroptera*, most of the *Quadrumana*, and especially in man. There is no *ligamentum teres*, and consequently no impression on the head of the *femur* or thigh bone.



Skeleton of Elephant.

Structure of internal soft parts.—The following internal soft parts are more particularly worthy of remark in the elephant. *Brain, &c.*—A portion of the *dura mater* from an Asiatic elephant may be seen in the Museum of the Royal College of Surgeons, in London (Gallery No. 1346), where the termination of the falx and the commencement of the tentorium or process which separates the cerebrum from the cerebellum are shown. The two fibrous layers of the dura mater are separated by a softer cellular substance, in which the vessels ramify; and it may be observed that the thickness of the dura mater is in proportion to the size of the skull, and of the entire animal, but not to the size of the brain, which does not much exceed that of the human brain, as will be seen in the preparation of the brain of a young Asiatic elephant (No. 1331). For though the absolute size of the organ exceeds that of man, the proportion which the cerebrum bears to the rest of the brain, and especially that part of the hemisphere which forms the roof and sides of the lateral ventricle, is much less. The hemispheres are broad and short, with a considerable development of the natiform protuberance. The convolutions are comparatively small and numerous. A lateral section has been removed from the left hemisphere, which shows that the anfractuosities are also deep, extending in some cases more than two-thirds of an inch into the substance of the brain. The hippocampus is comparatively smaller than in the ass, and the corpus striatum larger. The ventricle is seen to be continued into the olfactory bulb. The cerebellum is of considerable width, and its surface, as shown by the lateral section, is increased by numerous and complex anfractuosities. The tuber annulare corresponds in size to the development of the lateral lobes of the cerebellum. The corpora olivaria are remarkably prominent. The origins of all the cerebral nerves are shown, among which the olfactory nerves, of the fifth pair, which supplies the proboscis, are remarkable for their prodigious size; whilst the optic nerves, and those which supply the muscles of the eye, are remarkable for their small size. The *pia mater* is left on with the vessels at the base of the brain. A bristle is placed in the infundibulum. (Cat. Gallery, vol. iii.) The brain in man is from $\frac{1}{28}$ to $\frac{1}{35}$ of the body, that of the elephant $\frac{1}{500}$. The *stomach* is simple, the intestines are very voluminous, and the cæcum enormous. In the sanguiferous system the *heart* is worthy of note, and a section of the right auricle and ventricle of that of an Asiatic elephant may be seen in the museum last mentioned (Gallery, No. 924). In this animal, which, in some other respects, singularly resembles the *Rodentia*, three venæ cavæ terminate in the right auricle. Besides the Eustachian valve, which projects between the orifices of the inferior and left superior cavæ, there is also, as in the Porcupine, a rudiment of a superior valve, extending from the posterior side of the orifice of the right superior cava. The tricuspid valve, and its chordæ tendineæ and columnæ carneæ, are also well displayed. (Cat. Gallery, vol. ii.)

Reproduction, &c.—Romantic stories were formerly told of the extreme modesty of elephants; but Mr. Corse has disproved these and others which asserted that they would only reproduce the species in a state of nature, by showing that captivity and numerous witnesses formed no obstacle: but it must be remembered that the experiments recorded by him were made in India. Copulatio more equino. The period of gestation is twenty months and some days. The female mentioned by Mr. Corse produced a fine male, which was thirty-five inches and a half high just twenty months and eighteen days after she was first covered. The breasts of the female are placed under the chest, and the young one sucks, not with the trunk, but with the mouth. 'The young of the elephant, at least all those I have seen,' writes Mr. Corse, 'begin to nibble and suck the breast soon after birth; pressing it with the trunk, which, by natural instinct, they know will make the milk flow more readily into the mouth while sucking. Elephants never lie down to give their young ones suck; and it often happens, when the dam is tall, that she is obliged for some time to bend her body towards her young to enable him to reach the nipple with his mouth; consequently, if ever the trunk was used to lay hold of the nipple, it would be at this period, when he is making laborious efforts to reach it with his mouth, but which he could always easily do with his trunk if it answered the purpose. In sucking, the young elephant always grasps the nipple (which projects horizontally from the breast) with the side of his mouth. I have very often observed this; and so sensible are the attendants of it, that, with them, it is a common practice to raise a small mound of earth, about six or eight inches high, for the young one to stand on, and thus save the mother the trouble of bending her body every time she gives suck, which she cannot readily do when tied to her picket.' The maternal affection does not seem to be very strong in the female elephant, at least in captivity; for the same author states that tame elephants are never suffered to remain loose, as instances occur of the mother leaving her young and escaping into the woods; and he says that if a wild elephant happens to be separated from her young, for only two days, though giving suck, she never afterwards recognises or acknowledges it. 'This separation,' adds Mr. Corse, 'sometimes happened unavoidably, when they were enticed separately into the outlet of the *Keddah*. I have been much mortified at such unnatural conduct in the mother, particularly when it was evident the young elephant knew its dam, and, by its plaintive cries and submissive approaches, solicited her assistance.'

LIVING SPECIES.

Elephas Indicus. The Asiatic elephant differs from the African species, not only in its greater size and in the characters of the teeth and skull, but also in the comparative smallness of the ears, the paler brown colour of the skin, and in having four nails on the hind feet instead of three. The sagacity of this species is also supposed to be greater than that of the African elephants; but though many wonderful stories are told, and some of them are as true as they are wonderful, of the grateful remembrance which it long retains of benefits conferred, or of the tenacity with which it 'treasures up a wrong,' and though the instances of its docility, both antient and modern are very extraordinary, we agree, upon the whole, with Baron Cuvier, who observes, that after having studied these animals a long time, he never found their intelligence surpass that of a dog nor of many other carnivorous animals. It is imposing to see such a mountain of vitality obedient to the voice of its keeper and performing feats at his dictation; and the massive gravity of its physiognomy assists the impression.

The following is Mr. Corse's description of a perfect *Asiatic Elephant.* An elephant is said to be perfect when his ears are large and rounded, not ragged or indented at the margin; his eyes of a dark hazle colour free from specks; the roof of his mouth and his tongue without dark or black spots of any considerable size; his trunk large, and his tail long, with a tuft of hair reaching nearly to the ground. There must be five nails on each of his fore-feet, and four on each of the hind ones, making eighteen in all; his head well set on and carried rather high; the arch or curve of his back rising gradually from the shoulder to the middle, and thence descending to the insertion of the tail, and all his joints firm and strong.

The following are the castes (*Zat*) or varieties of the Asiatic elephant noticed by Mr. Corse. Both males and females are divided into two castes, by the natives of Bengal, viz., the *Koomareah* (of a princely race) and the *Merghee* (hunting elephant, from *mrigah* a deer, or hunting, or from its slender make), and this without any regard to the appearance, shape, or size of the tusks in the male, as these serve merely to characterize some varieties in the species. The *Koomareah* is deep-bodied, strong, and compact, with a large trunk and short but thick legs. The *Merghee* is generally taller but is not so compact nor so strong: he travels faster, has a lighter body, and his trunk is both short and slender in proportion to his height. As a large trunk is considered a great beauty in an elephant, the *Koomareah* is preferred, but not only for this, but for its superior strength, and greater capability of sustaining fatigue. The mixed breed is held in greater or less estimation in proportion as it partakes of the qualities of the *Koomareah* or *Merghee.* A breed from a pure *Koomereah* and *Merghee* is termed *Sunkareah* (from *sunkarah*, a mixture), or *Merghee-bauliah* (for the most part *Merghee*); but a farther mixture or crossing of the breed renders it extremely difficult for the hunters to ascertain the variety. Besides the *Koomareah, Merghee,* and *Sunkareah* breeds, several varieties are generally to be found in the same herd; but the nearer an elephant approaches to the true *Koomareah* the more he is preferred, especially by the natives, and the higher will be his price; though Europeans are not so particular, and will sometimes prefer a female *Merghee* for hunting and riding when she has good paces and is mild and tractable.

The variety of male termed *Dauntelah* (toothy, having large fine teeth,) produces the largest tusks and the finest ivory: his head is strongly contrasted with that of the *Mooknah* (probably from *mookh*, the mouth or face), which can hardly be distinguished in this respect from a female elephant, and the tusks of some of the females are so small as not to appear beyond the lip, while in others they are almost as large as in the variety of male called *Mooknah.* The *Dauntelah* is generally more daring and less manageable than the *Mooknah;* and for this reason, until the temper and disposition are ascertained, the Europeans prefer the *Mooknah;* but the natives who are fond of show generally take their chance, and prefer the *Dauntelah:* and though there is a material difference in their appearance as well as in the value of their tusks, yet, if they are of the same caste, size, and disposition, and perfect, there is scarcely any difference in their price.

There are many varieties between the *Mooknah* and *Dauntelah,* and these are varied according to the variation of the form of the tusks from the projecting horizontal, but rather elevated, curve of the *Pullung-Daunt** of the true *Dauntelah,* to the nearly straight tusks of the *Mooknah,* which point directly downwards.

Thus the *Goneish* or *Ganesa,* which is a *Dauntelah* that has never had but one tusk and this of the *pullung* [illegible] and which is so called from *Ganesa,* the Hindu god of wisdom, who is represented with a head like an elephant's, with only one tooth, was sold in Mr. Corse's time to [illegible] Hindu princes for a very high price, to be kept in state and worshipped as a divinity. Another variety of the *Dauntelah* has the large tusks pointing downwards and projecting only a little beyond the trunk: he is then said to be *Soor* or *Choordaunt* (Hog's teeth). A third is the *Puttul-dauntee,* whose tusks are straight like those of the *Mooknah,* only much longer and thicker. The *Ankoos Dauntee* is a fourth, and has one tusk growing nearly horizontal, like the *Pullung-Daunt,* and the other like the *Puttul-Daunt,* and there are other less distinct varieties.

The term *Goondah* seems to be used to designate the wandering male elephants which are much larger and stronger than the males generally taken with the herd, the *Goondah* departing from it or returning to it according to his desire. The *Goondahs* are supposed to be rarely taken with the herd: when they are so taken, their violence and ferocity renders them most destructive. Mr. Corse relates an instance of the ungovernable passions and terrible havock occasioned by the savage disposition of one, or at least a large male that was supposed to be one, when in the Keddah*. He was at length tied and led out, but his untameable spirit could not brook restraint, and after languishing about 40 days he died.

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* *Pullung* signifies a bed or cot, and *daunt* teeth; and, from the tusks projecting so regularly, and being a little curved and elevated at the extremities, the natives suppose a man might lie on them at his ease, as on a bed. (Corse.)

Mr. Hodgson in his paper 'on the Mammalia of Nepâl' (*Zool. Proc.* 1834) suggests that there are two varieties, or perhaps rather species of the Indian elephant, *Elephas Indicus*, viz., the Ceylonese, and that of the Saul Forest. 'The Ceylonese has a smaller, lighter head, which is carried more elevated; it has also higher fore-quarters. The elephant of the Saul Forest has sometimes nails on its hinder feet.'

The height to which the Asiatic elephant will attain has been variously stated; but upon a strict examination of alleged great heights, the natural disposition among men to exaggerate has generally been detected.

A male elephant, recorded by Mr. Corse was at its birth 35 inches high.

			Feet.	Inches.	
In one year he grew	11	inches, and was	3	10	high.
In the 2nd year	8	"	4	6	"
In the 3rd year	6	"	5	0	"
In the 4th year	5	"	5	5	"
In the 5th year	5	"	5	10	"
In the 6th year	3½	"	6	1½	"
In the 7th year	2½	"	6	4	"

A female elephant was six feet nine inches high at the time she came into Mr. Corse's possession, and was supposed to be 14 years old according to the hunters; but, according to the belief of Mr. Corse, she was only 11 years of age. During the next five years, before she was covered, she grew only six inches, but, while pregnant, she grew five inches in 21 months, and in the following 17 months, though again pregnant, she grew only half an inch. Mr. Corse then lost sight of her. She was at this time about 19 years old and had perhaps attained her full growth. Her young one was then but 29 months old, yet he was four feet five inches and a half high, having grown 18 inches since his birth. It thus appears that no certain standard of growth, for captive elephants, at least, can be depended on; nor do there seem to be any satisfactory data for defining the age at which the animal ceases to grow. Mr. Corse conjectures that elephants attain their full growth between the ages of 18 and 24. With regard to the height, the East India Company's standard for serviceable elephants was, in Mr. Corse's time, seven feet and upwards, measured at the shoulder in the same manner as horses are. At the middle of the back, they are considerably higher; and the curve or arch, particularly in young elephants, makes a difference of several inches. The lessening of this curve is a sign of old age when not brought on by disease or violence. During the war with Tippoo Sultaun, of the 150 elephants under the management of Captain Sandys, not one was ten feet high, and only a few males nine feet and a half. Mr. Corse was very particular in ascertaining the height of the elephants employed at Madras, and with the army under Marquis Cornwallis, where there were both Ceylon and Bengal elephants, and he was assured that those of Ceylon were neither higher nor superior, in any respect, to those of Bengal; nay, some officers asserted that they were considerably inferior in point of utility.

The only elephant ever heard of by Mr. Corse as exceeding 10 feet, on good authority, was a male belonging to Asoph Ul Dowlah, formerly vizier of Oude. The following were his dimensions:—

	Feet.	Inches.
From foot to foot over the shoulder	22	10½
From the top of the shoulder, perpendicular height	10	6
From the top of the head, when set up as he might march in state	12	2
From the front of the face to the insertion of the tail	15	11

And yet the Madras elephants have been said to be from 17 to 20 feet high. Now let us see how dimensions shrink before the severity of measurement. Mr. Corse heard from several gentlemen who had been at Dacca, that the Nabob there had an elephant about 14 feet high. Mr. Corse was desirous to measure him, especially as he had seen the elephant often at a former period, and then supposed him to be 12 feet high. He accordingly went to Dacca. At first he sent for the mahote or driver, who without hesitation assured him that the elephant was from 10 to 12 cubits, that is from 15 to 18 feet high; but added that he could not bring the elephant for Mr. Corse's examination without the Nabob's permission. Permission was asked and granted. Mr. Corse measured the elephant exactly, and was rather surprised to find that the animal did not exceed 10 feet in height.

Variety. The *white elephants* so much esteemed by the Indian sovereigns are merely Albinos.

Geographical Distribution.—The Asiatic elephant inhabits the greater part of the warm countries of Asia, and the large islands of the Indian archipelago. Mr. Corse states that the elephants for the service of the East India Company are generally taken in the provinces of Chittagong and Tipperah; but from what he had heard, those to the southward of Chittagong, in the Burmah territories and kingdom of Pegu, are of a superior breed. In confirmation of this opinion, he observes that the elephants taken to the south of the Gumty river, which divides the province of Tipperah from east to west, were generally better than those taken to the north of that river; and though elephants were taken at Pilibet as far north as lat. 29° in the vizier of Oude's territories, yet the vizier, and also the officers of his court, gave those taken in Chittagong and Tipperah a decided preference, they being much larger and stronger than the Pilibet elephant. Till the year 1790 Tipperah was a part of the Chittagong province; and so sensible was the Bengal government of the superiority of the southern elephants for carrying burdens, enduring fatigue, and being less liable to casualties, that in the then late contracts* for supplying the army, the contractor was bound not to send any elephant to the military stations taken north of the Chittagong province. Hence Mr. Corse concludes the torrid zone to be the natural climate, and the most favourable for producing the largest, the best, and the hardiest elephant; and that when the animal migrates beyond the tropics the species degenerates. He speaks of elephants being taken on the coast of Malabar as far north as the territories of the Coorgah rajah; but adds that these were much inferior to the Ceylon elephant, and that from this circumstance the report of the superiority of the Ceylon elephant to all others probably originated. He remarks that most of the previous accounts respecting the Asiatic elephant had been given by gentlemen who resided many years ago on the coast of Malabar or Coromandel, where, at that time, they had but few opportunities of seeing the Chittagong or the Pegu elephant.

Mr. Hodgson, in the paper above noticed, states that *Elephas Indicus* and *Rhinoceros unicornis* are both abundant in the forests and hills of the lower region of Nepâl, whence, in the rainy season, they issue into the cultivated parts of the Tarâi to feed upon the rice crops.

Habits, Utility to Man, &c.—In a state of nature the Asiatic elephant lives in great herds, which are generally said to be under the conduct of the old males, or bulls, as they are sometimes termed. From time immemorial the species has been brought under the dominion of man† and trained to swell the pomp of pageants, and add to the terrors of war, as well as to perform the more useful offices of a beast of burthen and draught, and the more dreadful one of executing the sentence of death on criminals. It has been long made the companion of the sports of the Orientalist in the great hunting parties; and from the same early period has been made to minister to the wanton and cruel pleasures of Eastern princes by being stimulated to combat not only with other elephants but with various wild animals. Our limits will not allow us to enter into the highly interesting detail of the mode of capturing this enormous animal, &c., &c.; and we must refer the reader to the second volume of the *Menageries*‡, where he will find an abundant and amusing collection of anecdotes connected with this subject, as well as a complete history of the elephant, both in the wild state and as the servant of man.

The tusks of both species still form, as they did from the earliest periods, a valuable article of commerce. The ivory which is now sought for useful purposes and ornaments of minor importance, was in great request with the ancient

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* Keddah is the name of the enclosure into which the wild elephants are driven and then captured.

* Mr. Corse's paper was read before the Royal Society in 1799.

† The earliest extant record in any European language of the mode of capturing the Indian elephant is in Arrian, *Indica*, chap. 13.

‡ 'Library of Entertaining Knowledge,' 8vo, London, 1831.

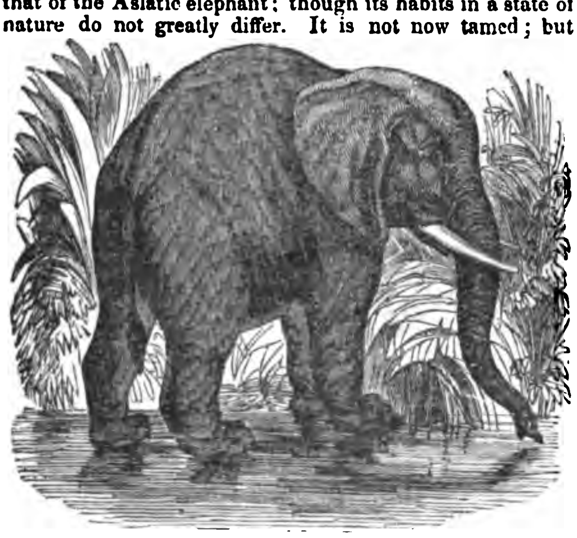
Greeks and Romans for various domestic uses, as well as for the Chrys-elephantine statuary rendered so famous by Phidias. Of these rich statues the Minerva of the Parthenon, and especially the Olympian Jupiter, appear to have been the master-pieces.

Elephas Indicus—Asiatic Elephant.

Elephas Africanus.—The African elephant is less than the Asiatic. The head is rounded; the front convex instead of concave; the ears are much larger than those of the Asiatic species; and the general number of nails on each hind foot is only three instead of four.

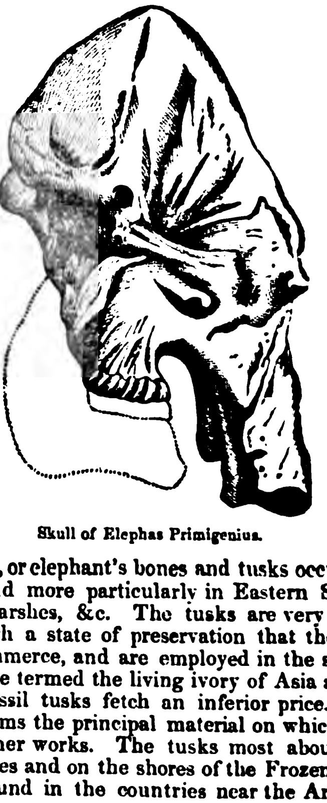
Geographical Distribution.—From Senegal to the Cape of Good Hope. Cuvier says that it is not known whether the species is found up the whole oriental side of Africa, or whether it is there replaced by the preceding species.

Habits, Utility to Man, &c.—The flesh is relished by the inhabitants of many districts of Africa. Major Denham speaks of it as being esteemed by all, and even eaten in secret by the first people about the sheikh; and he says that though it looked coarse it was better flavoured than any beef he found in the country. The antient Romans considered the trunk as the most delicious part; but Le Vaillant speaks of the foot as a dish for a king. The disposition of this species is supposed to be more ferocious than that of the Asiatic elephant; though its habits in a state of nature do not greatly differ. It is not now tamed; but there is good ground for believing that the Carthaginians availed themselves of the services of this species as the Indians did of those of the Asiatic elephant. The elephants exhibited in the Roman arena by Cæsar and Pompey appear to have been Africans; and from them principally, if not entirely, the ivory for ornamental purposes and the statues above alluded to, seems to have been taken. The tusks of this species are of great size.


Elephas Africanus. African Elephant.

Fossil Species.

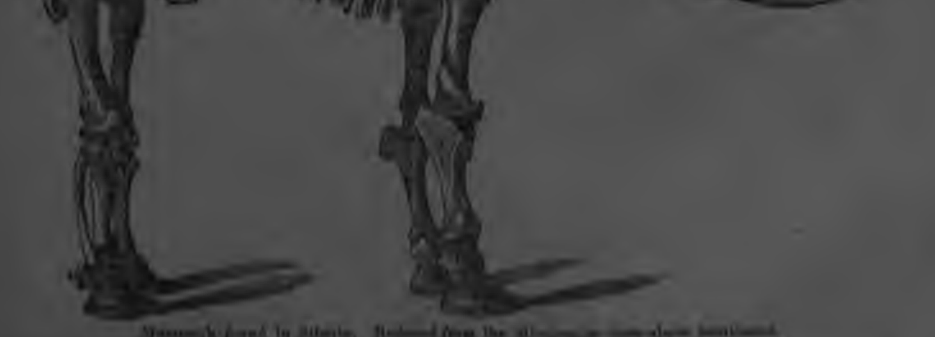
The third and fourth divisions of the tertiary fresh-water deposits (Pliocene period of Lyell) abound in extinct species of recent genera, and among them the remains of fossil elephants are very numerous. The alluvium, the crag, the ossiferous caverns, the osseous breccias, and the subappennine formations afford the most numerous examples. Cuvier ('Règne Animal,' last edit.) observes that there are found under the earth, in almost all parts of both continents, the bones of a species of elephant approximating to the existing Asiatic species, but whose grinders have the ribands of enamel narrower and straiter, the alveoli of the tusks longer in proportion, and the lower jaw more obtuse. An individual, he adds, found in the ice on the coasts of Siberia appeared to have been covered with hair of two sorts, so that it might have been possible for this species to have lived in cold climates. The species has, he concludes, long since disappeared from the face of the globe. This species he characterizes (Ossemens Fossiles) as having an elongated skull, a concave front, very long alveoli for the tusks, the lower jaw obtuse, the grinders larger, parallel, and marked with closer set ribands of enamel, and he designates it as *The fossil Elephant, Elephas primigenius* of Blumenbach, *Elephas Mammonteus*, Fischer, *The Mammoth* of the Russians.


Skull of Elephas Primigenius.

Mammoth's, or elephant's bones and tusks occur throughout Russia, and more particularly in Eastern Siberia and the Arctic marshes, &c. The tusks are very numerous, and in so high a state of preservation that they form an article of commerce, and are employed in the same way as what may be termed the living ivory of Asia and Africa, though the fossil tusks fetch an inferior price. Siberian fossil ivory forms the principal material on which the Russian ivory-turner works. The tusks most abound in the Laichovian Isles and on the shores of the Frozen Sea; and the best are found in the countries near the Arctic circle, and in the most eastern regions, where the soil in the very short summer is thawed only at the surface: in some years not at all. In 1799 a Tungusian, named Schumachoff, who generally went to hunt and fish at the peninsula of Tamut after the fishing season of the Lena was over, had constructed for his wife some cabins on the banks of the lake Oncoul, and had embarked to seek along the coasts for Mammoth horns (tusks). One day he saw among the blocks of ice a shapeless mass, but did not then discover what it was. In 1800 he perceived that this object was more disengaged from the ice, and that it had two projecting parts; and towards the end of the summer of 1801 the entire side of the animal and one of his tusks were quite free from ice. The summer of 1802 was cold, but in 1803 part of the ice between the earth and the *Mammoth*, for such was the object, having melted more rapidly than the rest, the plane of its support became inclined, and the enormous mass fell by its own weight on a bank of sand. In March, 1804, Schumachoff came to his mammoth, and having cut off the tusks, exchanged them with a merchant for goods of the value of fifty rubles. We shall now let

Mr. Adams, from whose account these particulars are abridged, speak for himself.

'Two years afterwards, or the seventh after the discovery of the mammoth, I fortunately traversed these distant and desert regions, and I congratulate myself in being able to prove a fact which appears so improbable. I found the mammoth still in the same place, but altogether mutilated. The prejudices being dissipated because the Tungusian chief had recovered his health,* there was no obstacle to prevent approach to the carcase of the mammoth; the proprietor was content with his profit from the tusks, and the Jakoutski of the neighbourhood had cut off the flesh, with which they fed their dogs during the scarcity. Wild beasts, such as white bears, wolves, wolverines, and foxes, also fed upon it, and the traces of their footsteps were seen around. The skeleton, almost entirely cleared of its flesh, remained whole, with the exception of one fore-leg. The spine from the head to the os coccygis,† one scapula, the basin and the other three extremities were still held together by the ligaments and by parts of the skin. The head was covered with a dry skin; one of the ears well preserved was furnished with a tuft of hairs. All these parts have necessarily been injured in transporting them a distance of 11,000 wersts (7330 miles); yet the eyes have been preserved, and the pupil of the eye can still be distinguished.‡ This mammoth was a male, with a long mane on the neck, but without tail or proboscis.' (The places of the insertion of the muscles of the proboscis are, it is asserted, visible on the skull, and it was probably devoured as well as the end of the tail.) 'The skin, of which I possess three-fourths, is of a dark grey colour, covered with a reddish wool and black hairs. The dampness of the spot, where the animal had lain so long, had in some degree destroyed the hair. The entire carcase, of which I collected the bones on the spot, is four archines (9 feet 4 inches) high, and seven archines (16 feet 4 inches) long from the point of the nose to the end of the tail, without including the tusks, which are a toise and a half (9 feet 6 inches, measuring along the curve; the distance from the base or root of the tusk to the point is 3 feet 7 inches) in length; the two together weighed 360 lbs. avoirdupois; the head alone, with the tusks, weighs 11 poods and a half (414 lbs. avoirdupois.) The principal object of my care was to separate the bones, to arrange them, and put them up safely, which was done with particular attention. I had the satisfaction to find the other scapula, which had remained not far off. I next detached the skin of the side on which the animal had lain, which was well preserved. This skin was of such extraordinary weight that ten persons found great difficulty in transporting it to the shore. After this I dug the ground in different places to ascertain whether any of its bones were buried, but principally to collect all the hairs which the white bears had trod into the ground while devouring the flesh. Although this was difficult from the want of proper instruments, I succeeded in collecting more than a pood (36 pounds) of hair. In a few days the work was completed, and I found myself in possession of a treasure which amply recompensed me for the fatigues and dangers of the journey, and the considerable expense of the enterprise. The place where I found the mammoth is about 60 paces distant from the shore, and nearly 100 paces from the escarpment of the ice from which it had fallen. This escarpment occupies exactly the middle between the two points of the peninsula, and is three wersts long (two miles), and in the place where the mammoth was found this rock has a perpendicular elevation of 30 or 40 toises. Its substance is a clear pure ice; it inclines towards the sea; its top is covered with a layer of moss and friable earth, half an archine (14 inches) in thickness. During the heat of the month of July, a part of this crust is melted, but the rest remains frozen. Curiosity induced me to ascend two other hills at some distance from the sea; they were of the same substance, and less covered with moss. In various places were seen enormous pieces of wood of all the kinds produced in Siberia; and also mammoths' horns (tusks) in great numbers appeared between the hollows of the rocks; they all were of astonishing freshness. How all these things could become collected there, is a question as curious as it is difficult to resolve. The inhabitants of the coast call this kind of wood *Adamschina*, and distinguish it from the floating pieces of wood which are brought down by the large rivers to the ocean, and collect in masses on the shores of the frozen sea. The latter are called *Noachina*. I have seen, when the ice melts, large lumps of earth detached from the hills mix with the water, and form thick muddy torrents which roll slowly towards the sea. This earth forms wedges which fill up the spaces between the blocks of ice. The escarpment of ice was 35 to 40 toises high; and, according to the report of the Tungusians, the animal was, when they first saw it, seven toises below the surface of the ice, &c. On arriving with the mammoth at Borchaya, our first care was to separate the remaining flesh and ligaments from the bones, which were then packed up. When I arrived at Jakutsk, I had the good fortune to repurchase the tusks, and from thence expedited the whole to St. Petersburg.' The skeleton is now in the Museum of the Academy, and the skin still remains attached to the head and feet. A part of the skin and some of the hair of this animal were sent by Mr. Adams to Sir Joseph Banks, who presented them to the Museum of the Royal College of Surgeons. The hair is entirely separated from the skin, excepting in one very small part, where it still remains attached. It consists of two sorts, common hair and bristles, and of each there are several varieties, differing in length and thickness. That remaining fixed on the skin is of the colour of the camel, an inch and a half long, very thick set, and curled



Mammoth found in Siberia. Reduced from the lithographic figure above mentioned.

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* He had [illegible] from the [illegible] of the discovery, as it was considered a bad omen.

† [illegible] ‡ [illegible]

§ This is doubtful; ‖ [illegible]

in locks. It is interspersed with a few bristles about three inches long, of a dark reddish colour. Among the separate parcels of hair are some rather redder than the short hair just mentioned, about four inches long; and some bristles nearly black, much thicker than horse hair, and from 12 to 18 inches long. The skin when first brought to the Museum was offensive; it is now quite dry and hard, and where most compact is half an inch thick. Its colour is the dull black of the living elephants. (*On the Mammoth, or Fossil Elephant, found in the Ice at the Mouth of the river Lena, in Siberia, with a lithographic Plate of the Skeleton.* From the 5th vol. of the Memoirs of the Imperial Acad. of Sciences of St. Petersburg, London, 1819, 4to.)

Fischer indicates the following species of fossil elephants resting principally on the difference of form in the molar teeth. 1. *Elephas mammonteus* (*E. primigenius*, Blumenb.) 2. *Elephas panicus*. 3. *Elephas proboletes*. 4. *Elephas pygmæus*. 5. *Elephas campylotes*. 6. *Elephas Kamenskii*. M. Nesti proposes a species under the name of *Elephas Meridionalis*, whose remains have been found in a freshwater formation in many places in Italy, and especially in the Val d'Arno. M. Nesti rests principally on the difference of the conformation of the cranium, and especially on an apophysis in form of a beak which terminates the lower jaw.

Dr. Harlan is of opinion that there are two species of fossil elephants peculiar to the United States.

Captain Cautley mentions the remains of elephants among those of mammalia found by him in the Sewalik mountains, at the southern foot of the Himalayas, between the Sutluj and the Ganges, partly lying on the slopes among the ruins of fallen cliffs, and partly in situ in the sandstone.

ELEPHANTA, a small island about seven miles in circumference, situated between the island of Bombay and the Maharatta shore, distant five miles from the latter and seven miles from the castle of Bombay. Its name among the natives is Gorapori; that by which it is known to Europeans was derived from the figure of an elephant cut out of the solid black rock on the acclivity of a hill about 250 yards from the landing-place, and which is a conspicuous object in approaching the island. This figure has been split in two, apparently by means of gunpowder, which injury is attributed to the religious zeal of the Portuguese invaders of Hindustan, which prompted them to destroy whatever they considered to be objects of pagan worship. In 1814 the head and neck of the elephant dropped off, and the figure is otherwise in such a state of decay as to threaten its speedy fall. At a short distance from the elephant stands the figure of a horse, also cut out of the rock. Mr. Dalrymple, in a description inserted in the Archæologia (vol. vii., page 324), says that this figure is still called the horse of Alexander, in memory of Alexander the Great, to whom has been attributed, without the least foundation, the excavation to which this island owes its celebrity. The construction of this cave has also been attributed, with no greater probability, to Semiramis; its origin is, in fact, involved in the greatest obscurity, although the rapidity with which its decay is seen to go forward seems to preclude the idea of its being the work of any very remote age. The entrance to this cave, or temple, occurs about half way up the steep ascent of the mountain or rock out of which it is excavated.

The length of this temple, measuring from the entrance, which is on the north side, is 130 feet, and its breadth 123 feet; the floor not being level the height varies from 15 feet to 17½ feet. The roof was supported by 26 pillars and 8 pilasters, disposed in four rows; but several of the pillars are broken. Each column stands upon a square pedestal, and is fluted, but instead of being cylindrical is gradually enlarged towards the middle. Above the tops of the columns a kind of ridge has been cut to resemble a beam about 12 inches square, and this is richly carved. Along the sides of the temple are cut between forty and fifty colossal figures varying in height from 12 to 15 feet; none of them are entirely detached from the wall. Some of these figures have on their heads a kind of helmet; others wear crowns with rich devices, and others again are without any other covering than curled or flowing hair. Some of them have four and others six hands, holding 'sceptres, shields, symbols of justice, ensigns of religion, weapons of war, and trophies of peace. On the south side, facing the main entrance, is an enormous bust with three faces, representing the triple deity, Brahma, Vishnu, and Siva. Brahma, the creator, occupies the centre position. This face measures 5 feet in length; the width from the ear to the middle of the nose is 3 feet 4 inches; the breadth of the whole figure is near 20 feet. On the right is the preserver, Vishnu; and Siva, the destroyer, is on the left, having in his hand a cobra capella, or hooded snake, and on his cap a human skull. To the left of this bust, among a group of uncouth figures, is one, a female figure, to which Niebuhr has given the name of Amazon, from the fact of its being without the right breast. This figure has four arms. The right fore-arm rests upon the head of a bull; the left fore-arm hangs down, and once contained something which is now mutilated and undistinguishable. The hand of the hinder right arm grasps a cobra capella, and that of the hinder left arm holds a shield. At the west side of the temple is a recess, 20 feet square, having in the centre an altar, upon which are placed symbols of a worship offensive to European notions of delicacy. The entrance to this recess is guarded by eight naked figures, each 13½ feet high, sculptured in a manner which shows that the people by whom they were executed must have made considerable progress in the statuary's art.

The cave is not at present used as a temple, nor has it any establishment of priests connected with it, although it is frequently visited by devotees for the purpose of offering prayers and oblations.

(Captain Hamilton's *Account of India*, 1744; Maurice's *Indian Antiquities*; Niebuhr's *Voyage en Arabie*; *Archæologia*, vol. vii.; *Asiatic Researches*, vol. i.)

ELEPHANTI'ASIS (ἐλέφας and ἐλεφαντίασις), [illegible] and *elephant disease*, so called partly on account of the supposed resemblance of the diseased skin to that of the elephant, but principally from the formidable nature of the malady. It is disgusting to the sight, says Aretæus, and in all respects terrible, like the beast of similar name.

The term is now commonly applied to two different diseases; first to a peculiar disease of the skin, one of the most formidable of the dreadful cutaneous affections which occur in hot climates, and more particularly where agriculture and the arts of civilization are imperfectly advanced; and secondly to a peculiar disease of the leg, which becoming enormously tumid, is conceived to bear some resemblance to the leg of an elephant.

The first distemper, elephantiasis properly so called, is a tubercular disease of the skin. The tubercles present a shining appearance; they are of different sizes, and are of a dusky red or livid colour on the face, ears, and extremities. The tubercles are accompanied with a thickened and rugous state of the skin, a diminution or total loss of sensibility, and a falling off of all the hair excepting that of the scalp.

The disease is wholly unknown in this country. It is described as slow in its progress, sometimes continuing several years without materially deranging the functions, but gradually producing an extraordinary degree of deformity. The following is the description commonly given of this formidable malady; but there is reason to believe that the picture is much exaggerated.

The alæ of the nose become swelled and scabrous; the nostrils are dilated; the lips are tumid; the external ears, particularly the lobes, are enlarged and thickened, and beset with tubercles; the skin of the forehead and cheeks grows thick and tumid, and forms large and prominent rugæ, especially over the eyes; the hair of the eye-brows, the beard, the pubes, axillæ, &c., falls off; the voice becomes hoarse and obscure; and the sensibility of the parts affected is obtuse or totally abolished, so that pinching or puncturing them gives no uneasiness. This disfiguration of the countenance suggested the idea of the features of a satyr or a wild beast; whence the disease was by some called *Satyriasis*, and partly also on account of the excessive libidinous disposition said to be connected with it; and by others *Leontiasis*, from the laxity and wrinkles of the skin of the forehead, which resembles the prominent and flexible front of the lion.

As the malady proceeds, the tubercles begin to crack, and at length to ulcerate; ulcerations also appear in the throat and in the nose, which sometimes destroy the palate and the cartilaginous septum; the nose falls; and the breath is intolerably offensive; the thickened and tuberculated skin of the extremities becomes divided by fissures, and ulcerates, or is corroded under dry sordid scabs, so that the fingers and toes gangrene and separate joint after joint

The large misshapen leg, which is also often termed elephantiasis, arises from a repeated effusion and collection of a lymphatic and gelatinous matter in the cellular membrane under the skin, in consequence of inflammation of the lymphatic glands and vessels. The skin itself is much thickened in the protracted stages of the disease, and its vessels become greatly enlarged; its surface grows dark, rough, and sometimes scaly. As the effusion first takes place after a febrile paroxysm, in which the inguinal glands of the side about to be affected are inflamed, and the limb is subsequently augmented in bulk by a repetition of these attacks, Dr. Hendy termed the malady the glandular disease of Barbadoes, in which island it is endemial. In England it is often called the Barbadoes leg. Except when these paroxysms occur, the functions and constitution of the patients are not materially injured, and they often live many years, incommoded only by carrying about 'such a troublesome load of leg.'

In this country the disease is only seen in its inveterate stage, after repeated attacks of the fever and effusion have completely altered the organization of the integuments of the limb, and rendered it altogether incurable. In this state the swelling is hard and firm, does not pit on pressure, and is entirely free from pain. The skin is thickened and much discoloured; its blood vessels are enlarged, particularly the external veins, and the lymphatics distended; and the cellular substance is flaccid and sometimes thickened, and its cells much loaded with a gelatinous fluid. The muscles, tendons, ligaments, and bones are generally in a sound state.

In this advanced stage the disease is altogether irremediable. Little success indeed seems to have attended the practice employed in the earlier stages, which has chiefly been directed to alleviate the febrile paroxysms by laxatives and diaphoretics and subsequently to strengthen the system by cinchona. Local bleeding has not been employed; but after the fever and inflammation have subsided, the practice of binding the limb in a strong bandage is strongly recommended as the best means of exciting absorption, and of reducing the swelling. (Dr. Bateman's *Practical Synopsis of Cutaneous Diseases.*)

ELEPHANTINE. [[illegible]]

ELETTARIA, a genus established by the late Dr. Maton of the plant yielding the lesser cardamoms. The name is that (elettari) under which it was first figured by Rheede, *Hort. Mal.* xi. t. 4, 5, and is softened into *elachee* (Sanskrit *ela*), the common appellation of this aromatic over all India. The genus belongs to the natural family of Scitamineae, or Zingiberaceae of some authors; besides this it includes three other species, of which one E. cardamomum medium, is a native of the hilly countries in the vicinity of Sillet. Dr. Roxburgh concludes from the form of the capsule and its acrid, aromatic taste, that it is the plant which produces the Cardamomum medium of the writers on materia medica. The whole of the species, differing chiefly in their radical inflorescence, are however by Dr. Roxburgh and some other botanists, referred to the genus Alpinia.

Elettaria Cardamomum is a native of the mountainous forests of the coast of Malabar, especially above Calicut, in the Wynaad district, between 11° and 12° of N. lat. where the best are produced. It is therefore well placed; for cardamoms formed a portion of the early commerce, which subsisted between this part of India and Arabia, whence they must have been made known to the Greeks, as they are described by Dioscorides and mentioned as early as the time of Hippocrates.

The cardamom plant delights in moist and shady places on the declivities of the hills. It is cultivated from portions of the root in the district of Soonda Balaghat, but the fruit is very inferior; but the best grows in a wild state, at least where no other measures are adopted, than clearing away the weeds from under the largest trees, which are felled close to the roots. The earth being loosened by the force of the fallen tree, young cardamom plants shoot forth in a month's time, and are sheltered by the shade of the branches. The tree-like herbaceous plants attain a height of from 8 to 12 feet. The root is as tuberous and tuberous as that of the ginger, and the leaves, with long sheathing footstalks, are from one to two feet in length, placed in two rows, and lanceolate in shape, like those of the Indian shot (Canna Indica) common in English gardens. The scapes, or flower- and fruit-bearing stalks, make their appearance in February of the 4th year, from the base of the stems, are three to four in number, and from one to two feet long, lax, and resting on the ground. The fruit is ripe in November, and requires nothing but drying in the sun to be fit for commerce.

Species of Amomum, q. v., yield the other kinds of cardamom.

ELEVATION. ANGLE OF ELEVATION. [ALTITUDE.]

ELEVATION (Architecture). [DESIGN, ARCHITECTURAL.]

ELEUSIS, a celebrated town of Attica, on the borders of Megaris. In very ancient times it is said to have been an independent state of some importance, and carried on a war with Athens, by the result of which it became subject to that city. (Thucyd. ii. 15.) Eleusis owed its celebrity in the historical age to its being the principal seat of the mystical worship of Demeter, who, in search of her daughter, was said to have rested by the well Callichorus, at Eleusis, and to have taught Triptolemus the use of corn on the Rharian plain, near the city. This worship subsisted at Eleusis from the earliest period of history to the time of Alaric. Eleusis stood near the northern shore of the Gulf of Salamis. Its port was small and circular, and formed by two piers running out into the sea. Traces of a theatre have been found on a hill about half a mile from the sea. The temple of Demeter was commenced by Ictinus, in the administration of Pericles, and finished by Philo under the auspices of Demetrius Phalereus. It was originally a Doric building in antis, but was afterwards changed into a decastyle temple, with fluted columns. The upper part of an admirably executed colossal statue of Ceres, or Proserpine, brought from Eleusis by Dr. E. D. Clarke, is now in the vestibule of the public library at Cambridge. A modern village on the site is called Lefsina.

Coin of Eleusis.

British Museum. Actual Size. Copper. Weight 50 grains.

ELEUSINIA, the great mystic festival of Demeter celebrated at Eleusis in the month Boedromion. The lesser mysteries were celebrated in Elaphebolion at Agrae, on the Ilissus, and were a sort of preparation for the Eleusinia. The great festival began on the 15th Boedromion, and lasted nine days. The first day was called the assembling (ἀγυρμός), as in it all who had been initiated in Elaphebolion were invited to complete their sacred duty. The second day was named ἅλαδε μύσται, 'to the sea ye initiated!' from the words of the proclamation by which they were admonished to purify themselves. This purification took place in the *Rheti*, two streamlets of salt water running into the gulf of Salamis and which separated the territory of Eleusis from the rest of Attica. The third day was called [illegible], from some ceremonies imitative of the marriage of Proserpine, which took place on that day. What was the name or employment of the fourth day is unknown. The fifth was called the 'day of the torches,' λαμπάδων ἡμέρα, on account of a lampadephoria, or torch-procession in which the initiated marched two and two round the temple. The initiations took place on the sixth and seventh days of the feast. The sixth day, which was called Iacchus, was the chief day of the Eleusinia. On this day the statue of Iacchus was carried in procession from the Ceramicus to Eleusis, and back again on the following day, which was named the return of the fully-initiated ([illegible]). The seventh day was called Epidauria, in honour of Æsculapius, who did not arrive from Epidaurus to be initiated until after the return of the Epoptae. The ninth day was called πλημοχόαι. The ceremony of this day consisted in the symbolical overturning of two vessels filled with wine. Those initiated at the lesser mysteries were called μύσται, from μύω 'to shut up,' because they were bound to strict silence; those who had passed through the Eleusinian ceremonies were called ἐπόπται or ἔφοροι, 'contemplators,' because they had been admitted to see the sacred objects: they were also hailed as happy and fortunate (ὄλβιοι, [illegible]). The initiation consisted in a set of rites not very different, it is believed, from the free-masonry of modern Europe, though the effects were far from the same, and the initiated were not supposed to be bound to one another by any particular tie. Every Athenian was obliged to pass through these ceremonies once in the course of his life. Bastards, slaves, and prostitutes, as well as strangers, and in later time Christians and Epicureans, were excluded from the Eleusinia. To reveal any of the mysteries, or to apply to private purposes any of the hallowed solemnities, was considered a capital crime. The priests at Eleusis belonged to the house of the Eumolpidæ. The chief priest was called the Hierophant, the second in rank the Torch-bearer (δᾳδοῦχος), the third the Sacred Herald (ἱεροκήρυξ), and the fourth the Altar-priest (ὁ ἐπὶ βωμῷ). The other two festivals of Demeter, the Demetria and the Thesmophoria, must be distinguished from the Eleusinia. (Jul. Poll. i., § 37.)

ELGINSHIRE, formerly and by some still called MORAYSHIRE, a small county of Scotland lying between 57° and 58° N. lat., and between 3° and 4° W. long. It is bounded on the north by the Moray Frith (Æstuarium Varar of Ptolemy); on the south by Inverness-shire and Banffshire; on the east by Banffshire; and on the west by Nairnshire and Inverness-shire. A portion of Inverness-shire intersects and divides Elginshire into two separate parts to the north and south. The north part approaches to a circular figure, in diameter nearly 25 miles. The south part has about half this extent of area, and a very irregular outline. The line of sea-coast measures about 35 miles, and presents in some parts precipitous rocks, in others a beach of level sands. The low country forms a plain varying from five to twelve miles in width from the sea-shore to the mountainous district, and extending from the river Spey to the western boundary. It is intersected by small ridges running nearly parallel with the line of coast. On the southern course of the Spey are some considerable plains. The rest of the country, including the distinct southern part, is hilly, and the cultivated land lies chiefly on the banks of the streams in the valleys. The number of entire parishes is fifteen; of eight others, five partially belong to Banffshire, three partially to Inverness, and one partially to Nairn. The soil of the eastern part of the large northern plain is principally sandy, with small fields of clay and peat. The middle and western parts are chiefly clay and loam. The arable and pasture lands of the mountainous district are for the most part sand and sandy loam. Considerable tracts of peat moss occur in the south-east part, and patches of it here and there throughout the country. In the Agricultural Survey, published in 1811, the proportion of waste land is stated to be about three times the amount of that in cultivation, but since that time some extension of and improvements in agriculture have been made, though a great deal yet remains to be done.

The rivers are the Spey, the Lossie, and the Findhorn, which flow in a north-east and nearly parallel course to the sea. The Spey, one of the most productive fishing rivers in Scotland, has its source in the south west part of Invernessshire, and forms a great portion of the boundary line between Elgin and Banff. In the upper part of its course its branches extend 15 miles on each side, and it drains about 800,000 acres. It is not navigable except for floating timber-rafts from the large forests of Strathspey; but its salmon fishery is of great importance and rents for more than 8000*l.* a year. Since 1815 the depth of water to the extent of two miles out in the Speymouth Bay has diminished six feet, in consequence of the deposit of gravel carried down by the stream, the velocity of which is four or five miles an hour. This river is said to discharge into the sea a greater quantity of water than the Thames. The devastation occasioned by its great overflowings in 1829 is described by Sir T. D. Lauder in the work on the Great Floods in Moray.

The Findhorn rises also in Inverness-shire, and passes through Elginshire near the western boundary. Fir timber from the extensive forests on its banks is floated down in separate logs. The entrance from the sea to the large æstuary at its mouth is rendered difficult by a bar of sand, though the port and quay at the village of Findhorn are commodious for small vessels. The salmon fishery is valuable, but inferior to that of the Spey.

The Lossie is formed by the confluence of numerous streams in the centre of the shire; it passes to the north of the town of Elgin and falls into the sea on the eastern side of Loch Spynie. In a course of twenty miles it turns numerous corn mills and some manufacturing machinery near Elgin. There was formerly a salmon fishery on this river, but at present the number of fish which enter is too small to offer any encouragement to the fishers. There is a port for small shipping at the Lossiemouth, five miles north-east of Elgin. Large embankments of earth have been raised at great expense along each side of this river through the low plains between Elgin and the sea, in order to prevent a recurrence of the calamitous inundation which happened in 1829, of which a very interesting description is given in Sir Thomas Dick Lauder's 'Account of the Great Floods in Moray;' a work containing much valuable information respecting this county.

Near Lossiemouth is the large Loch Spynie, the drainage of which has been imperfectly made at an expense of 10,800*l.*; but the expectation of finding its bed suitable for cultivation has been disappointed. The drainage of two or three small lakes between Elgin and Alves has also been proposed. The south portion of the county contains several lakes surrounded with picturesque mountain scenery. The lake of Glenmore is circular, and two miles in diameter: and Loughnadurb, in the south-west extremity, is four miles in length. Chalybeate springs are found in all parts of the county, but none are much distinguished for medicinal qualities; and it is remarked as a curious fact that the holy wells are of pure water exempt from any mineral taint.

The principal roads are, one which intersects the northern part of the county from Fochabers on the east to Burghead on the north and Forres on the west, passing through the town of Elgin; one from Elgin to Craig-Elachie bridge on the Spey; and two, one on the east from Fochabers, the other on the west from Forres, which communicate with the south portion of the county. A large proportion of Elginshire is covered with forests and plantations, chiefly of Scotch fir and larch. Many thousands of acres which fifty years ago, were naked moor, are now clothed with various kinds of firs, interspersed with oaks, ash, and beeches. The aspect of the northern low country, although generally fertile and well-cultivated, is dull, flat, and unvaried; but in the southern highlands, especially in the parish of Knockando, on the banks of the Spey, the scenery is often highly picturesque and romantic; having mountains covered with broom and heather, richly wooded slopes, deep and gloomy glens, with lofty rocks, torrents, and waterfalls, and mossy banks abounding in many varieties of beautiful flowers, overhung by the honeysuckle and the wild rose. This woody district is a sheltered resort for all the ordinary kinds of singing and game birds; of the roe-deer, fox, hare, rabbit, badger, &c. The summits of Cairngorm (blue mountains), in the southern extremity of the south division of the county, are seldom free from snow; the highest point is 4080 feet above the sea. James R. Cairn, in the south part of the north division, is considered the highest elevation in the county, and commands, in clear weather, a very extensive prospect.

Geology and Mineralogy.—The rocks in the south consist of granite, felspar, mica, sandstone, slate, gravel, and rock crystal. The banks of the Spey towards its mouth exhibit secondary rocks of red sandstone which dip into the basin of the Moray Frith, and extend westward through the northern plain of the county. The upper beds are soft, and are cut into ravines by the rivulets. The rocks are covered with a great depth of sand, gravel, and other alluvial matter, so that the soil often on the same farm varies from strong clay to rich loam and light and gravelly soil. Numerous large granitic boulder stones, which are useful for building, are found far from their parent rocks. (*New Statistical Account of Scotland*, part viii. p. 83.) Many large and inexhaustible quarries of freestone are worked, especially near the coast. Those on Quarrywood Hill, near Elgin, have supplied the stone for the handsome public edifices in that town. It is there found in large blocks adapted for pillars, millstones, and pavements. Its colour is yellow and white, and it takes a fine polish. One or two quarries of slate supply the county with roofing materials. Neither coal nor any metallic ores of importance are found; but peat occurs in various places. The beds of peat, which are generally from four to twelve feet in thickness, lie on gravelly sand or clay, and are covered at the surface with a mossy turf about ten inches deep. The peat is in general use for fuel, but when burning it often emits a disagreeable smell of sulphur. A similar smell rises from the surface of the fields of peat when heated by the sun. It changes the colour of silver to a leaden hue, and corrodes utensils of copper or iron. Numerous trunks of oak and fir trees, many of them large, intermixed with boughs of birch and alder and hazel nuts, are found deeply imbedded in the peat mosses. These are considered by the old bishop of Ross, in his description of Moray, to have been thus deposited by the Deluge; but closer observation shows this fossil timber to have fallen by the action of fire, and in some instances by the axe; and geologists, judging from the quantities of marine shells and other fossil remains discovered beneath the surface, believe the northern plain to have been once the bed of the sea.

Antiquities, Buildings, Bridges.—In the parish of St. Andrew's Lhanbryd is a small Druidical structure, supposed to have been standing nearly 2000 years; another has been broken up to macadamize a piece of road. The ruins of the castle of the lords of Duffus stand on the margin of Loch Spynie; the tumuli or cairns, the supposed tombs of ancient warriors, which are remaining on the heights along the shore, and the ruins of the Roman, or, according to others, the Danish, fortifications at Burghead, all deserve the attention of the antiquarian. In the parish of Urquhart are the remains of Druidical *lithoi*, forming a circular temple. The magnificent priory of Pluscardine, near Elgin, is sufficiently entire to shew the plan of the structure and its numerous offices. The surrounding wall encloses nearly twelve acres. The church of Birnie is of great antiquity, and contains vestiges of Druidical and Scandinavian art. It was one of the earliest consecrated places of the Roman hierarchy in the north of Scotland. Its curious old bell is described by Sir Thomas Dick Lauder. The ruins of the ancient palace of the bishops of Moray, on the south bank of Loch Spynie, are those of a magnificent castle, whose lofty halls and deep vaults were flanked by towers, gates, and ditches. The fortified castle on the lonely isle called Lochindorb, in the mountain wilds of the south-west extremity, is a romantic ruin of a place besieged by King Edward I. in his war with Bruce. Many more ruins and fragments of feudal castles and strongholds and monasteries are remaining, some of them famous in the legends of chivalry; also several of the artificial hills of sand, on which the *blaze*, or signal fire, anciently flamed to summon the warriors to battle. In barrows, cairns, and caves, and on the site of camps, have been found skeletons, stone coffins, and Danish and Lochaber dirks and battle-axes made of copper. Near the town of Forres is 'King Sueno's Stone,' a large column or obelisk with many curiously-sculptured historical figures, representing the expulsion of the Danes from Scotland, or, as others think, the murder of Macduff; and a wooded hill, called the Knock of Alves, near the town of that name, is famous in tradition as being the place where the usurper Macbeth consulted 'the Weird Sisters,' when, according to Shakspeare, he inquired—

> 'How far is 't called to Forres? What are these,
> So wither'd and so wild in their attire,
> That look not like the inhabitants of the earth,
> And yet are on 't?'

The foundations of the castle of Forres, in which Macduff was murdered, have been removed, and the green mound on which it stood has been levelled for the erection of a modern mansion. On a mount near the obelisk is an octagonal tower, raised to the memory of Nelson. Its diameter is 24 ft. and the height 70 ft., and the top is finished with a battlement, surmounted with a mast, ropes, and flag.

One of the finest and most useful of the public structures in this county is the bridge erected over the Spey, in 1804, from Fochabers to Elgin. The strength required to resist the impetuous force of the river when swollen with mountain-torrents is well provided for by massive piers deeply based in the rock and supporting four circular arches, of which the two smallest have each a span of 75 ft., and the two in the middle a span each of 95 ft.; that is, 19 ft. wider than the central arch of Westminster Bridge. The cost was 13,000*l.* The Spey is also crossed by an elegant bridge of cast iron at Craig Ellachie, a very picturesque point of its course, in the western extremity of the parish of Knockando. The banks of the river are here formed by lofty rocks, and the centre of the span of the arch is more than 150 ft. above the water. This bridge was constructed in 1814 at a cost of about 10,000*l.* The following are some of the principal mansions of the nobility and gentry:—Darnaway Castle, near Forres, is a magnificent palace, containing a spacious old hall of the fourteenth century, capable of entertaining 1000 men. The building is beautifully encompassed by several thousand acres of ancient forest and plantations. Brodie House is an elegant mansion in a very extensive park. The Grange, near Alves, and Burgie Castle adjoining it, are large and elegant edifices. Innes House, in the parish of Urquhart, was the noble residence of the lairds of Innes. The spacious mansions of West and East Elchies are in the old baronial and castellated style. Knockando House is beautifully situated near the river Spey. Many more might be enumerated, this county being particularly rich in baronial mansions and seats of the opulent classes.

Agriculture, Climate.—The county was anciently reputed 'the Granary of Scotland.' In the great famine at the end of the seventeenth century, oatmeal was procured from Elgin for the districts south of the Grampian Hills, and at present it furnishes some of the best samples of wheat in the London market. (Mac Culloch's *Statistics of the British Empire*.) The soil of the lowland district about the latitude of Elgin is remarkably fertile, and especially adapted for the growth of wheat, oats, and barley, of which it produces many heavy and luxurious crops, a great portion of which is shipped at Speymouth, Burghead, Lossiemouth, and Findhorn, for the Scotch and English markets. The climate of this part of the country is noted for its general mildness, dryness, and salubrity, owing, it is thought, to the low level of the surface, which is little above that of the sea, and to the absorbent sandy nature of the soil. Instances occur of extraordinary longevity, and, as a winter residence for invalids, some physicians have considered it preferable to Devonshire. However, at the beginning of spring, a bleak easterly wind generally prevails for several weeks, blasting throughout the country the germinating corn and budding trees, and severely affecting sickly and delicate constitutions. (*Agricultural Survey*, 1811.) In the summer the wind is gentle from west-south-west, and in winter occasionally violent from west-north-west. The soil and climate of the southern highlands are less favourable for the cultivation of grain; and a great portion of the surface is still covered with native forests, or with uninclosed commons of furze and broom, abounding in rabbits, which greatly damage the crops. Oats and barley were formerly the only kinds of grain produced; wheat, though now one of the staple articles of commerce, is of comparatively recent introduction, and still more recent is the cultivation of peas, beans, clover, grasses, turnips, and potatoes; yet the turnip husbandry is very extensively and successfully adopted, and potatoes are as common as in Ireland. No uniform course of cropping is pursued; yet, on each of the larger farms, a six-shift rotation is generally used, by which it is divided into one-sixth in green crop, one-third in grass or clover, and one-half in corn, but the succession of each crop is more dependent on individual opinion and convenience than on any principles of experimental science. The land is in the possession of a few large proprietors. The annual rent of the arable land varies from 7*s.* to 40*s.* per acre, and leases are taken commonly for nineteen years. The average produce of an acre of wheat or oats, of very superior quality, is from three to four quarters. Several mills are established for the preparation of pot-barley. [BARLEY, p. 460.] Oats being the principal article of food consumed by the peasantry, they are given very sparingly to horses. All the bread used by the labouring classes is wholly of oatmeal made simply with water into flat cakes, and baked over a wood fire in a pan. Their breakfast invariably, and frequently their other meals, consists of various preparations of oatmeal. In the form of porridge it is flavoured with onions, butter, pepper, sugar, milk, beer, or whiskey, and for supper it receives an addition of shredded kail or turnips. The farinaceous solution obtained by steeping oat-bran is called *sowens*. It is thick and gelatinous, and slightly acidulated by fermentation. Among servants and farm labourers it is consumed in large quantities. This paste is also dried and preserved in lumps for the convenience of those who require a portable breakfast. Sheep and horses are reared, for the most part, only for domestic use. The cheviot breed of sheep has been extensively introduced to cross that of the old white-faced and the small brown-faced breeds of Moray. The breed of native cattle has been improved by importations from Skye, Aberdeen, and Argyle. Stock of this kind are bred for, and sold to, the graziers of the southern counties. During the last thirty years numerous agricultural improvements have been attempted, and many with success, which, in part, is justly attributable to the premiums offered by the Farmers' Club at Elgin. New roads have been opened and some old ones made conveniently passable; large tracts of waste have been planted with trees; good horses and implements have been procured; many wretched farm-houses and offices have been rebuilt on superior plans; draining, over and under, has been adopted; inclosures have been made; and lime is much used for manuring, &c. The peasantry, who are naturally hardy and thrifty, have become in the same period considerably improved in knowledge, habits, manners, dress, and mode of living; still, it is truly asserted that Elgin, as to improvement, is greatly in the rear of many other counties of Scotland. Inclosures, for instance, are not general, and are made chiefly by dikes of loose stones: rent is yet partially paid in produce and labour, and such customs as night-wakes for the dead are still superstitiously observed. The Gaelic language is used among a few of the highlanders, but the peasantry in general speak a barbarous dialect of the English, of which a glossary, containing several hundred specimens, is given at the end of Mr. Leslie's 'Agricultural Survey.'

Education.—The people of this county, as in most parts of Scotland, highly appreciate the advantages of early instruction. A well-attended and well-conducted parochial school exists in every parish, and it is a rare occurrence to meet with a youth of either sex, however humble, who is not able at least to read and write. At several of these parochial establishments the masters, though their salaries seldom exceed 30*l.* a year, teach Latin, Greek, mathematics, geography, book-keeping; in short all the knowledge requisite either for entering upon a course of collegiate studies or commercial business. The more populous parishes have each one or more private schools, of which some are of superior character. Several Sunday-schools have been established, and a few small circulating libraries. This county, with the exception of the royal burghs of Elgin and Forres, shares in Mr. Dick's bequest. [BANFFSHIRE, p. 370.]

Commerce and Manufactures.—The chief articles exported are corn, timber, whiskey, and salmon. Of 204 vessels which in 1834 sailed from the Speymouth, 50 were laden with 18,000 quarters of oats and wheat, chiefly for Leith and London. Large quantities are also shipped at the ports of Findhorn, Burghead, and Lossiemouth, whence trading vessels and steam-packets regularly sail for London. At the Speymouth since 1793, 150 vessels, several above 750 tons burden, have been built entirely of natural fir from the forests on the bank of this river. It is greatly superior to that which is planted, and for ships appears to be no less durable than oak, as they are insured at Lloyd's on similar terms, and some of the largest dimensions have been employed in the trade with China and India.

Though the great flood of 1829 greatly damaged the harbour at the mouth of the Spey, the sales of timber thence exported still amount to 10,000*l.* or 11,000*l.* per annum. In the last war, when foreign timber was excluded, the annual amount commonly exceeded 40,000*l.* About 300 rafts are annually floated down the Spey from the parish of Abernethy, a distance of forty miles; and 100 men are employed at saw-mills in cutting timber into planks.

From eight to twelve smacks are employed by the Salmon Fishery Company of the Spey, in conveying salmon to London. In 1834, seventy-two cargoes were shipped, each on an average containing 280 boxes, the weight of each box being 112 lbs., and its value 5*l.* The fishing commences on the 1st of February, and ends on the 14th of September. About eighty boats are employed in the herring fishery off the port of Burghead. The salmon fishery on the river Findhorn is of less extent. At Linkwood, near Loch Spynie, the principal manufacture of whiskey is carried on in a spacious range of buildings erected for the business of malting, grinding, and distilling. The capacity of the stills is from 170 to 400 gallons each. The annual quantity of barley manufactured is 1200 quarters; and the annual quantity of liquor produced about 20,000 gallons. It is of great strength and purity, and is almost wholly consumed in this and the adjoining county of Nairn. Two other fine distilleries are in the highland parish of Knockando. From 70 to 100 cargoes of coals, Scotch and English, are annually imported for limekilns, distilleries, and domestic fires.

Besides the county town of Elgin, there is but the town of Forres which can be properly so designated: all other places in the county being merely villages, each with a population less than a thousand. That of Forres amounted, in 1831, to 3895. In the middle of the 10th century, under the reign of King Macduff, this town was a place of more importance than Elgin, from which it is distant twelve miles to the west. King James IV. of Scotland, in 14[illegible], made it a royal burgh with separate jurisdiction. One street, extending about a mile from east to west, having the town hall, church, and gaol in the centre, comprises the whole town. It is pleasantly and picturesquely situated on elevated ground, surrounded by verdant fields and w[illegible] heights. The houses are neat and of modern construction, though some of an antient date present here and there their pointed gables. At the western extremity, half-encircled by a brook, is the green hill on which stood the castle of Macbeth, which, with the adjoining obelisk, and N[illegible] monument, have already been noticed. The salmon fishery on the Findhorn gives employment to a few of the inhabitants; the rest belong chiefly to the agricultural class. The grammar-school maintains a good reputation, and there are several superior private academies. A well supplied market is held on Wednesdays, and several small fairs in the course of the year. Fochabers is a small modern-built market town, with a population of about 800, situated on the east bank of the Spey, about five miles from the mouth. The inhabitants are employed for the most part in manufacturing cotton, thread, and worsted. The site of the antient town was a mile to the north of its present position, and near the noble mansion of the duke of Gordon, of which the extensive park is only partly in the shire of Elgin. Burghead is a pretty village, with neat accommodation for sea-bathers. Its port is frequented by numerous vessels of about 80 tons burden.

The population of the county in 1831 was 34,231. In conjunction with Nairnshire, it sends one member to parliament.

(*New Statistical Account of Scotland*, 1835; L[illegible] *Agricultural Survey of Moray*, 1811; Dr. Lachlan S[illegible] *History of Moray*, 1775.)

ELGIN, the county town of the shire of Elgin, is agreeably situated in the north lowland plain of corn-fields, [illegible] the road which connects, and nearly at an equal distance from, Forres on the west, and Fochabers on the east. The small river Lossie passes near, in a winding course [illegible] western and northern sides, and is crossed at five different points by substantial stone bridges. The town con[illegible] one main street, extending nearly a mile, and numerous narrow lanes which intersect the main street at right an[illegible] contain houses of antient date and construction. E[illegible] the end of the tenth century was an important place, w[illegible] royal fort. The earliest charter was granted by Alexa[illegible] in 1234. Various grants were ratified by Charles I. in a charter issued in 1633; but none of the lands and privileges thus conferred have ever been possessed. At a remote [illegible] the neighbourhood was adorned with ecclesiastical p[illegible] and other extensive establishments of monks and [illegible] The civic arms represent St. Giles in sacerdotal attire [illegible] crosier and book, and the motto 'sic itur ad astra.' The most interesting and magnificent ruins in this coun[illegible] those of the cathedral of Elgin, which was founded in [illegible] In 1390 the original structure was destroyed by [illegible] gratify the revenge of 'The Wolf of Badenoch' again[illegible] bishop of Moray. It was immediately rebuilt on a p[illegible] similar to that of the cathedral of Lichfield; but [illegible] scale of much greater magnitude, and with far m[illegible]borate ornaments. The regent Morton, in 156[illegible] stripped off the lead of the roof to procure money [illegible] payment of his troops, this venerable specimen of ar[illegible]ture and sculpture was left to decay as a monument of popish superstition. In 1711 the great central tower [illegible] the ground; but the two western turrets, the walls [illegible] choir, and parts of the nave and transept are still [illegible]ing. The loftiness of the fabric, the symmetry an[illegible] of design, and the great profusion of laboured scul[illegible] grotesque and elegant, must excite the greatest adm[illegible] of the skill and perseverance of the artists. A colle[illegible] attached to the cathedral, and included within its w[illegible] the house and gardens of the bishop, and those [illegible] canons. Part of the wall, which had four gateways, was 900 yards in circuit and four yards in hei[illegible] remains, with the eastern gateway, formerly secured [illegible] iron grate, a portcullis, and a watchman's lodge. O[illegible] south side of the town are the ruins of a convent of Grey Friars, and on a hill at the west are the remains of an ancient fort. The Elgin institution for the support of old age and the education of youth, is a handsome quadrangular building, at the eastern entrance, surmounted with a circular tower and a dome. The whole is constructed of beautiful freestone and ornamented with Doric columns and sculptured figures; and the interior is very conveniently laid out in school-rooms, eating-halls, dormitories, wards for the sick, a chapel, and various other offices. The building, play-grounds, and shrubbery cover an area of about three acres. The objects of this excellent charity are threefold: an almshouse for age and indigence; a school for the support and education of labourers' children, and a free-school solely for education. The inmates of the first class are 10 in number, of the second class 40, of the third class 220.

The new church in the centre of the town is one of the most elegant in the north of Scotland. It has a richly ornamented cupola, and a Doric portico. Grey's Hospital, at the western extremity, is a similar structure, with a Grecian portico and a central dome.

The sectarian places of public worship are numerous, and include an episcopal and a Catholic chapel. The schools within the town, endowed and private, are ten in number, and are generally well-conducted and efficient establishments. The Elgin Academy consists of three parochial schools of very superior character. The subjects taught are English reading, writing, grammar, and composition, arithmetic, geography, mathematics, French, Latin, and Greek. Courses of lectures on natural philosophy are occasionally delivered and illustrated by an experimental apparatus. The salaries of the teachers are each about 44*l.* per annum. A literary society for the purpose of procuring reviews and other periodical publications was established in 1815, and is still in prosperous existence; and also an extensive and valuable circulating library. There are many endowed charities, and various other religious and benevolent institutions. The Morayshire Farmer's Club was instituted in 1799. The members have subscribed the sum of [illegible]*l.*, which is very judiciously appropriated to the improvement of agricultural science, and the collection of valuable books on every department of rural economy.

The following observation on the progress of improvement in Elgin, is made in the *New Statistical Account of Scotland*, No. VIII., p. 27: 'Forty years ago there were no turnpike-roads leading to or from it; no stage-coaches, no gas lights, indeed no lighting, nor any side pavement in the streets, no hospital for the sick, no institution for the support of old age or the education of youth, no academy, no printing-press, and no newspaper.' All these desiderata are now possessed. Many new and more convenient houses have been built, and the progress of knowledge and comfort are very apparent; improvements however are still wanting in the efficiency of the police, in the supply of water by pipes, and in the removal from the heart of the town of that greatest of nuisances, the butchers' shambles. The population of the town in 1831 was 6130.

The burgh, in conjunction with Banff, Cullen, Inverury, and Kintore, sends one member to parliament.

ELGIN MARBLES, the designation given to a collection of ancient sculpture, chiefly from the Acropolis of Athens, whence it was obtained by the Earl of Elgin (who had been the English ambassador to Turkey) between the years 1801 and 1812. This collection was purchased in pursuance of an act of the legislature, dated July 1st, 1816, for the sum of 35,000*l.*, and is now deposited in the British Museum, in a room built especially for its reception.

The *Parthenon*, or Temple of Minerva, at Athens, whence the more important of these sculptures were obtained, was built during the administration of Pericles, about the year B.C. 448. It was constructed entirely of white marble from Mount Pentelicus; Callicrates and Ictinus were its architects; and its sculptures were produced partly by the hand and partly under the direction of Phidias.

The sculptures of the Parthenon in the Elgin collection are of three descriptions: Metopes; a portion of the Frieze of the cella; and Statues and their parts from the tympana or pediments.

The *Metopes* are fifteen in number, from the frieze of the peristyle on the southern side of the building, and bear reference to the contest between the Centaurs and the Lapithæ. The Centaurs were invited to the nuptials of Pirithous, king of the Lapithæ. During the marriage-feast one of them, named Eurytion or Eurytus, elated by wine, offered violence to the person of Hippodamia, the bride. This outrageous act was immediately resented by Theseus, the friend of Pirithous, who, hurling a large vessel of wine at the head of the offender, brought him lifeless to the ground. A general engagement then ensued between the two parties; and the Centaurs not only sought to revenge the death of their companion Eurytus, but likewise attempted to carry off all the females who were guests at the nuptials. In this conflict, sustained on both sides with great fury, the Centaurs were finally vanquished. Such is the general outline of the mythic history represented in the Metopes. There is a sixteenth Metope, placed as No. 9; but it is a cast from one now in the Louvre gallery at Paris, the original of which, formerly belonging to the same series, was purchased for that collection in 1818, at the sale of the Count de Choiseul Gouffier, who before the French Revolution had been his king's ambassador in Turkey. The most interesting of the Elgin Metopes are Nos. 3, 11, 12, and 13. The three last mentioned are the finest in point of execution.

In an uninterrupted series of very low relief, placed round the cella, immediately below the ceiling of the porticoes of the Parthenon, was the *Frieze*, representing the solemn quinquennial procession, called the Panathenæa. The procession was represented as advancing in two parallel columns from west to east, one along the northern, the other along the southern side of the temple, and facing inwards after turning the two angles of the eastern front, and moving towards its centre. Such was the frieze in its original position. Of its remains the Elgin collection possesses an extent, in slabs and fragments of marble, beginning at No. 17, of rather more than 249 ft., with a continuation of plaster casts of more than 76 ft. The greater part of the last are from portions of the sculpture which were not brought away, including a single slab, No. 23, which likewise belonged to the Count de Choiseul, now in the gallery of the Louvre; all forming a total of representation from the frieze of very near 326 ft. The bas-reliefs which at present compose the frieze in the Elgin Room, as far as they extend, are placed in the same order in which they were originally seen upon the Parthenon. Those on the principal front of the temple, namely, the east, are placed first, then follow those of the north, and lastly those of the west and south. They are arranged, in short, in the same manner in which the spectator viewed them as he approached the temple by the east and walked round it by the north, west, and south. But the spectator in the Elgin Room has to keep in mind that what formerly surrounded an exterior wall now lines the interior of a room.

The slabs 17 to 25, on the left of the entrance into the room, form the eastern frieze, the portion which occupied the east end of the temple. The figures on slab 17, the Virgins of Attica, head the procession from the southern frieze. The slab 19, the longest in the collection, stood immediately above the eastern entrance or door, and was the centre of the composition. In this slab, upon the left, a Priestess is represented, supposed to be the wife of the principal archon, or chief magistrate of Athens, in the act of receiving from two canephori, or bearers of the mystic baskets, the articles serving for the rites of sacrifice. To her left stands the Archon, in a drapery which reaches from the head to the feet, receiving from the hands of a youth a piece of cloth folded in a square form in numerous thicknesses, conjectured to be the peplus, or embroidered veil, the sail of the Panathenaic ship, and the principal ornament of the procession. On each side of the groups which represent the priestess and archon are various seated figures, among which Jupiter, Minerva, Triptolemus, Æsculapius, and Hygeia are the most conspicuous. Another train of females head the procession as it comes from the northern frieze; and here the sculptures which adorned the eastern front of the Parthenon terminate. This part of the frieze is greatly mutilated; but the explanation of it is aided by some drawings of the Parthenon made in 1674 by Jacques Carrey for the Marquis de Nointel, at a time when the sculptures were a little more perfect. These drawings are in the Royal Library at Paris, and copies of them are in the British Museum.

From the Nointel drawings it appears that the virgins who led the procession from the northern frieze, like those on the southern side, were followed by oxen led as victims; the foreigners settled in Athens were likewise represented, with the players on the flute and lyre; and a troop of citizens closed the train of persons on foot. But all these have disappeared. Nineteen metopes and a large portion of the northern frieze fell when the Acropolis was besieged by the Venetians in 1687, and these subjects were amongst them. The slabs with which the remains of this frieze now open, No. 26 to 31, consist of chariots and charioteers in action, followed by a train of horsemen, Athenian citizens of the second class, who served in the cavalry. This, the most beautiful portion of the whole frieze, extends from No. 32 to 45; in the forms and actions of the horses, in the attitudes and costumes of the riders, and in the distribution of the figures, the sculptors seem to have reached the highest excellence of their art in the department of low relief. The bridles of the horses, in many of the slabs here referred to, were originally of gilded bronze, as appears by the holes left in the marble. Small pieces of the bronze itself were found by lord Elgin's formatori when taking moulds for him from this part of the frieze in its original position.

A single slab of the western frieze (but of exquisite beauty, No. 47), is all which the Museum possesses in marble. Plaster casts of fourteen slabs, which form the remainder of the western frieze, and which are still attached to the Temple, follow it, numbered 48 to 61. The western frieze extended over the front, and over the antæ of the opisthodomos, or back chamber. The direction of the figures is the same as that on the north side, namely, from right to left. There is a peculiarity, too, in the frieze of the west end, which distinguishes it from that on the north and south sides of the temple. The subjects represented on the slabs of those two sides run one into another: that is, what was left imperfect in one slab is completed in the next; whereas in the west end the subjects are nearly complete on each piece of marble. The western frieze is likewise distinguished from those of the two sides of the temple by the comparatively few figures introduced into it.

We now come to that portion of the frieze which enriched the southern side of the Temple. The direction of the figures which form it is from left to right, and the numbers being in continuity from the western frieze, begin with the end of the procession, and extend from 62 to 90, round to the door of entrance into the Elgin room. In this, as in the western frieze, the spectator is supposed to have his face turned respectively to the north and south sides of the temple. A considerable number of the slabs, No. 62 to 77, represent horsemen; 78 to 82 consist of chariots; a collection of citizens and old men, corresponding with those of the northern frieze, but more numerous, preceded these; all, however, but a single fragment of four women (No. 83) have disappeared. In the slabs and fragments numbered 84 to 90 we see the sacrificial oxen, and upon the turn of the slab 90 is a figure, believed to be that of a magistrate looking round upon the procession which follows him. He is interposed between the end of the procession on the northern, and the beginning of that upon the eastern frieze.

Of the *Statues* and fragments from the tympana, or pediments, of the Parthenon, those toward the southern end of the Elgin Room, No. 91 to 98, are from the eastern pediment, the allegory of which represented the Birth of Minerva; these consist of the neck, the shoulders, and the arms of the figure of Hyperion rising from the sea, the Horses of Hyperion, the recumbent statue called Theseus, the goddesses, supposed to be Ceres and Proserpine, Iris with her veil inflated, Victory winged, the Fates, and the head of one of the Horses of Night. Those toward the northern end, No. 99 to 106, are from the western pediment, the allegory of which represented the Contest of Minerva and Neptune for the guardianship of Attica. With the exception of the first figure, the Ilissus, or River God, they are fragments, and were broken in an effort to remove them from the pediment after the siege of 1687. The greater part were recovered by lord Elgin by excavating below a house which had been built out of the ruins beneath the pediment, and which he had purchased. They consist of the torso of Cecrops, a fragment of the face and the chest of Minerva, the upper part of the torso of Neptune, a fragment of the Ericthonian Serpent, the torso of Apteral Victory, and the lower part, or rather lap, of the figure of Latona. M. Quatremère de Quincy, in his 'Monumens et Ouvrages d'Art Antique,' fol., Par., 1829, has given two plates of the pediments of the Parthenon in which all the figures are conjecturally restored.

Between, and separating the sculptures of the two pediments (No. 119), stands an imperfect statue of a youth of the size of life, of exquisite workmanship, supposed to have formed part of a group of Dædalus and Icarus: all that is certainly known of it, is, that it came in fragments, and from the Acropolis.

Casts from the temple of Theseus, and others from the bas-reliefs of the choragic monument of Lysicrates, are set into the eastern wall of the Elgin Room, the first above the latter, at the northern end, below the Panathenaic frieze.

Of the remainder of the Elgin collection, it may be sufficient to name a few marbles of highest character, such as the colossal statue of Bacchus, from the choragic monument of Thrasyllus, No. 111, and the Caryatide, from the Temple of Pandrosus, No. 128. Of architectural fragments, two pieces of frieze, from the treasury of Atreus, at Mycenæ, Nos. 177, 180, are the most antient; the capital and portion of a shaft, No. 112, give a notion of the magnitude of the columns of the Parthenon: and the capital and shaft from the temple of Erectheus, No. 126, present the most beautiful example of the Ionic order now known. The frieze of the temple of Erectheus is also one of the most valuable parts of the collection. Among the inscriptions, the Sigean, written in the most antient Greek characters, and in the Boustrophedon manner, No. 107, claims the first place, followed by numerous others relating to the temples and buildings of Athens, some containing decrees or treaties, and a few inventories of the treasurers of the Parthenon: sepulchral inscriptions, urns, and stelæ abound in the collection; and among these the epitaph on the warriors who fell at Potidæa. (Thucyd. i. 63.) Votive bas-reliefs and offerings are also preserved in it in large number. The last article we shall name is a vessel of beautiful form, an urn of bronze; it was found in a tumulus situated on the road which leads from the Piræus to the Salaminian ferry and Eleusis, enclosed within the marble vase in which it now stands, and in it was a deposit of burnt bones, a lacrhymatory of alabaster, and a sprig of myrtle in gold. It is supposed, from the last article, to have contained the ashes of some amatory poet.

The possession of the Elgin collection has established a national school of sculpture in our country, founded on the noblest models which human art has ever produced. A tribute of thanks is due to the nobleman to whose exertions the nation is indebted for it. If Lord Elgin had not removed them, the greater part would long since have been utterly destroyed. In the last siege of Athens the Parthenon suffered additional damage.

ELIMINATION (Algebra), the process of reducing a number of equations, containing certain letters, to a smaller number, in which one or more of the letters shall not be found. The simplest case of elimination, and therefore the best adapted for the explanation of the term, is the following: if A be equal to B and B be equal to C, then A is equal to C. In the result, B is eliminated. Any operation of algebra may produce elimination. We give four instances in which such a result is obtained by addition, subtraction, multiplication, and division.

1. $x+y=12$, $x-y=8$; add, $2x=20$: y is eliminated.

2. $x+z=a$, $y+z=b$; subtract, $x-y=a-b$: z is eliminated.

3. $xy=a$, $\frac{2x}{3y}=b$; multiply, $\frac{2}{3}x^2=ab$: y is eliminated.

4. $xy=a$, $yz=b$; divide, $\frac{x}{z}=\frac{a}{b}$: y is eliminated.

The process of elimination, in the case of more complicated equations, becomes difficult and frequently impracticable. So much is this subject connected with the theory of equations, that a treatise on the first would be the larger portion of one on the second. The writings on this subject are scattered, but most works on algebra contain all that is absolutely necessary.

ELIOT, JOHN, often called the apostle of the Indians, was a native of England, born in 1604. He was educated at the university of Cambridge, and distinguished himself by proficiency in theology and in antient languages. Having seceded from the established church and embraced the ministry, he emigrated, like many other sufferers for conscience, to New England, and arrived at Boston in 1[illegible]. In the following year he married, and finally established his stead at Roxbury, only a mile distant, as minister of a small congregation, composed chiefly of friends in whose religious service he had previously engaged himself, in case they should follow him across the Atlantic. In discharging the duties of his function he was zealous and efficient; and he was also earnest in spreading the blessings of education, by promoting the establishment of schools.

Having qualified himself, by learning their language, to become a preacher to the Indians, he commenced his missionary labours October 28, 1646, before a large assembly collected by his invitation a few miles from Roxbury. Many, it is said, on this and on a subsequent occasion, seemed deeply touched; and it is evident, by the questions asked of the preacher, that the understandings, as well as the feelings of his audience, were roused. From the chiefs and powaws, or conjurors, both of whom felt interested in maintaining ancient manners and superstitions, he usually met with opposition. Still no small number were converted, and these, abandoning their savage life, united in communities, to which lands were granted by the provincial government. In 1674 there were seven Indian praying-towns containing near 300 persons, thus settled in Massachusetts, under the care of Eliot, besides a still greater number of converts, to whom land had not been thus assigned.

In travelling among the woods Eliot underwent great physical labour and hardship, and his mental labour was unremitting. He translated the Old and New Testament and several religious treatises into the Indian tongue, which were printed for distribution, chiefly at the expense of the Society for Propagating the Gospel; he composed an Indian grammar, and several treatises on subjects not directly religious, for the use of his converts and pupils, and also wrote a number of English works. Nevertheless he lived to the age of 86, and resigned his pastoral charge at Roxbury only two years before his death, which took place in 1690. A colleague had been appointed to assist him in 1650, in consequence of his necessary and frequent absence. His private character appears to have been very beautiful: he was not only disinterested and zealous, but benevolent, self-denying, and humble. Baxter says, in one of his letters, 'There was no man on earth whom I honoured above him.' (Cotton Mather, *Eccl. Hist.* b. iii., and *Life of John Eliot.* A modern *Life of John Eliot*, Edinburgh, 1828, 12mo., contains a good deal of information concerning the early attempts to convert the Indians.)

ELIOTT, GEORGE AUGUSTUS, was born at Stobbs in Scotland, in 1718. He studied the mathematics and other sciences at Edinburgh, and afterwards went to the University of Leyden, where he made great proficiency in classical literature, and was remarkable for the elegance and fluency with which he spoke the French and German languages. His knowledge of tactics was acquired in the celebrated school at La Fère. Having attained the rank of lieutenant-colonel, he accompanied George II. to Germany in 1743 as his Majesty's aid-de-camp, and was wounded at the battle of Dettingen. In the Seven Years' War, he fought in 1757 under the duke of Cumberland and Prince Ferdinand of Brunswick, and greatly distinguished himself at the head of his celebrated regiment of light-horse, raised and formed by himself, and called by his name. He was second in command in the expedition against the Havannah, the capture of which important place was highly honourable to the courage and perseverance of the British troops. After the peace he obtained the rank of lieutenant-general, and was appointed in 1775 to the government of Gibraltar. His memorable defence of that important fortress against the combined efforts of France and Spain was the last exploit of his life, the splendour of which so far eclipsed all that had preceded it, that he is most familiarly known as 'the gallant defender of Gibraltar.' After the peace he was created a peer by the title of Lord Heathfield. He suddenly died, at his favourite country seat, Kalkofen, near Aix-la-Chapelle, whither he had gone for the benefit of the waters, July 6, 1790, in the seventy-third year of his age. ([illegible].)

ELIQUATION, an operation by means of which a more fusible substance is separated from another which is less fusible. It was formerly employed in the purification of silver, but is now little used.

ELIS or **ELEA**, a district of the Peloponnesus, included between Achaia, Arcadia, Messenia, and the sea. Its coast was extended from the promontory Araxus to the mouth of the river Neda. Elis was originally divided into three parts, the northern, called hollow Elis (κοίλη Ἦλις); the southern, Triphylia; and that in the middle, Pisatis. The earliest inhabitants of this territory were the Epeans and Pylians, who occupied the whole western coast of the Peloponnesus from Araxus to Taygetum, the line of demarcation between these two tribes being on a line with Cape Ichthys. (Leake's *Morea*, ii., p. 187.) The chief towns of the Epeans were, in the time of Homer, Elis and Buprasium. (*Iliad*, ii. 615, ψ 630.) The Eleans were the first people in the Peloponnesus who experienced the effects of the Dorian invasion, as their territory was the landing-place of the invaders, and was assigned by them to their ally the *Ætolian* Oxylus, who claimed to be descended from Ætolus, the son of Endymion, a mythical king of the Epeans. Oxylus and his new subjects conquered Pisa and Olympia, where the Olympian games were established about 1104 B.C., though they were not regularly celebrated till Corœbus gained the prize in 776 B.C. These games exercised a most important influence on the subsequent destinies of Elis. The reverence with which the Greeks in general regarded this festival was extended to the country in which it took place, and the districts in the neighbourhood of the cities of Olympia and Elis were always free from the ravages of war so long as the games maintained their respectability. In the earlier periods the people of Pisa, which was in the immediate neighbourhood of Olympia, sometimes presided over the celebration of the games; but the wars between Messenia and Sparta enabled the Eleans to form a very intimate connection with the Spartans which ended in a tacit understanding that the intervening sea-coast should be divided between the two powers; the resistance of the Pisatæ only brought upon them the destruction of their city and the annexation of all Triphylia to Elis. This happened as early as the 50th Olympiad; and when Agis invaded Elis and occupied Olympia in the 95th Olympiad (400 B.C.), the power of the Pisatæ was so entirely overthrown that the Spartan king would not take the administration of the games from the Eleans, on the ground that those who claimed it were mere peasants and not fit for so great a charge. (Xen. *Hellenica*, iii., c. 2.) The harmony between Elis and Sparta was interrupted during the Peloponnesian war by the countenance which the Spartans afforded to the Lepreatæ, and the Eleans endeavoured to avenge this interference by excluding the Spartans from the Olympic games. After some years of misunderstanding, they were compelled to return to the Spartan alliance by the invasion of Agis, mentioned above. In 365 B.C. they were engaged in a war with the Arcadians, which deprived them of almost all their southern territories. The Eleans were firm supporters of the Ætolians during the social war, and never joined the Achæan league.

The city of Elis was originally called Ephyra, and, according to Colonel Leake, changed its name in the time of Oxylus. (*Travels in the Morea*, i., p. 5.) The site of the ancient capital is now called Paleopoli. 'The ruins consist of several masses of Roman tile and mortar, with many wrought blocks of stone and fragments of sculpture scattered over a space of two or three miles in circumference.' (Leake, i., p. 5.) The soil was sandy, argillaceous, or a rich mould, and stone was found only in the mountains. (Leake, ii., p. 175.) The territory was very fertile and populous, and is said to have been the only one in Greece which produced flax. Its principal rivers are the Alpheius (Rofeo) and the Peneius (Gastuni). Its chief mountain, Pholoe, was celebrated in ancient poetry and mythology. This name appears to have been given to all the high lands of Elis north of the river Alpheius. The principal sea-port of Elis was Cyllene, which Colonel Leake supposes to be the modern Chiarenza. (*Travels in the Morea*, ii., p. 174.)

Coin of Elis.

British Museum. Actual Size. Silver. Weight 186⅘ grains.

ELIXIR OF VITRIOL. [SULPHURIC ACID.]

ELIZABETH, queen of England, the daughter of Henry VIII. by his second wife, Anne Boleyn, was born at Greenwich, 7th September, 1533. She was not three years old therefore when her mother was brought to the block, in May, 1536. Very soon after her birth it was declared, by the Act 25 Henry VIII., c. 22, that if Queen Anne should decease without issue male, to be begotten of the body of the king, then the crown, on the death of the king, should go 'to the Lady Elizabeth, now princess, and to the heirs of her body lawfully begotten.' By this act therefore Henry's female issue by his present queen was placed in the order of succession before the male issue he might have by any future wife. By the 28 Henry VIII., c. 7, however, passed after his marriage with Jane Seymour, his two former marriages were declared to be unlawful and void, and both Elizabeth and her elder sister Mary were bastardized. But finally, by the 35 Henry VIII., c. 1, passed soon after his marriage with his last wife, Catharine Parr, it was declared that if Prince Edward should die without heirs, then the crown should remain first to the Lady Mary, and, failing her, to the Lady Elizabeth. This was the last legal settlement of the crown, by which her position was affected, made previous to Elizabeth's accession; unless indeed she might be considered to be excluded by implication by the Act 1 Mary, st. 2, c. 1, which legitimatized her sister Mary, declared the validity of Henry's first marriage, and pronounced his divorce from Catherine of Aragon to be void.

In 1535 a negotiation was entered into for the marriage of Elizabeth to the duke of Angoulême, the third son of Francis I. of France; but it was broken off before any agreement was come to. In 1546 also Henry proposed to the Emperor Charles V., with the view of breaking off a match then contemplated between the emperor's son, the prince of Spain, afterwards Philip II., with a daughter of the French king, that Philip should marry the Princess Elizabeth; but neither alliance took place.* Elizabeth's next suitor, though he does not seem to have formally declared his pretensions, was the protector Somerset's unfortunate brother, the Lord Seymour of Sudley. He is said to have made some advances to her even before his marriage with Queen Catharine Parr, although Elizabeth was then only in her fourteenth year. Catharine, who died a few months after her marriage (poisoned, as many supposed, by her husband), appears to have been made somewhat uncomfortable while she lived by the freedoms the princess continued to allow Sudley to take with her, which went beyond ordinary flirtation; the scandal of the day indeed was, that 'the Lady Elizabeth did bear some affection to the admiral.' After his wife's death he was accused of having renewed his designs upon her hand; and it was part of the charge on which he was attainted that he had plotted to seize the king's person and to force the princess to marry him; but his execution in the course of a few months stopped this and all his other ambitious schemes.

In 1550, in the reign of Edward VI., it was proposed that Elizabeth should be married to the eldest son of Christian III. of Denmark; but the negotiation seems to have been stopped by her refusal to consent to the match. She was a favourite with her brother, who used to call her his 'sweet sister Temperance;' but he was nevertheless prevailed upon by the artful and interested representations of Dudley to pass over her, as well as Mary, in the settlement of the crown which he made by will a short time before his death. [EDWARD VI.]

Camden gives the following account of the situation and employments of Elizabeth at this period of her life, in the introduction to his history of her reign. She was both, he says, 'in great grace and favour with King Edward, her brother, as likewise in singular esteem with the nobility and people; for she was of admirable beauty, and well deserving a crown, of a modest gravity, excellent wit, royal soul, happy memory, and indefatigably given to the study of learning; insomuch, as before she was seventeen years of age she understood well the Latin, French, and Italian tongues, and had an indifferent knowledge of the Greek. Neither did she neglect music, so far as it became a princess, being able to sing sweetly, and play handsomely on the lute. With Roger Ascham, who was her tutor, she read over Melanchthon's Common-Places, all Tully, a great part of the histories of Titus Livius, certain select orations of Isocrates (whereof two she turned into Latin), Sophocles's Tragedies, and the New Testament in Greek, by which means she [illegible] framed her tongue to a pure and elegant way of [illegible] &c.' (*English Translation in Kennet's Collection.*)

It appears from what Ascham himself tells us [illegible] 'Schoolmaster' that Elizabeth continued her Greek [illegible] after she ascended the throne: 'after dinner' (at W[illegible] Castle, 10th December, 1563), he says, 'I went up [illegible] with the Queen's Majesty: we read there together [illegible] Greek tongue, as I well remember, that noble orat[illegible] Demosthenes against Æschines for his false dealing [illegible] embassage to King Philip of Macedonia.'

On the death of Edward, Camden says that an [illegible] was made by Dudley to induce Elizabeth to re[illegible] title to the crown for a sum of money, and certain [illegible] be settled on her: her reply was, 'that her elder [illegible] the Lady Mary, was first to be agreed withal; for [illegible] as the said Lady Mary lived she, for her part, could [illegible] lenge no right at all.' Burnett says that both she [illegible] Mary, having been allured by messages from Dudl[illegible] no doubt wished to get them into his hands, [illegible] their way to town, when the news of Edward's [illegible] proaching end induced them to turn back. When M[illegible] came to London after being proclaimed queen, the [illegible] Elizabeth went to meet her with 500 horse, accord[illegible] Camden, others say with 2000. Fox, the martyr[illegible] relates that 'Queen Mary, when she was first queen, [illegible] she was crowned, would go no whither, but would [illegible] her by the hand, and send for her to dinner and supp[illegible] Mary's coronation, in October, 1553, according to H[illegible] shed, as the queen rode through the city towards W[illegible] minster, the chariot in which she sat was followed [illegible] another 'having a covering of cloth of silver, all white, [illegible] six horses trapped with the like, wherein sate the L[illegible] Elizabeth and the Lady Anne of Cleve.' Another ac[illegible] says that Elizabeth carried the crown on this occasion.

From this time Elizabeth, who had been brought up [illegible] their religion, became the hope of the Protestant [illegible] Her position however was one of great difficulty. At [illegible] she refused to attend her sister to mass, endeavour[illegible] soothe Mary by appealing to her compassion: after [illegible] time however she yielded an outward compliance. The [illegible] Act passed by the parliament, which, although it did [illegible] mention her by name, bastardized her by implicati[illegible] annulling her father's divorce from his first wife, could [illegible] fail to give her deep offence. Availing herself of an [illegible] of Mary, assigning her a rank below what her birth e[illegible] her to, as an excuse for wishing to retire from court, [illegible] obtained leave to go to her house at Ashridge, in Buc[illegible] hamshire, in the beginning of December. About the [illegible] time Mary is supposed to have been irritated a[illegible] her sister by the preference shown for Elizabeth b[illegible] kinsman Edward Courtenay, whom, after releasing [illegible] the Tower, the queen had restored to his father's [illegible] earl of Devon, and is said to have had some thoug[illegible] marrying. It appears to have been part of the des[illegible] the rash and unfortunate attempt of Wyatt, in the [illegible] ning of the following year, to bring about a mar[illegible] between Elizabeth and Courtenay, who was one of [illegible] engaged in the revolt. This affair involved Eliza[illegible] the greatest danger. On the 8th of February, the [illegible] after the suppression of the insurrection, certain me[illegible] of the council were sent with a party of 250 (other ac[illegible] say 600) horse to Ashridge, with orders to bring h[illegible] London 'quick or dead.' They arrived during the [illegible] and although they found her sick in bed, they immedi[illegible] forced their way into her chamber, and informed her [illegible] she must 'prepare against the morning, at nine o[illegible] clock, to go with them, declaring that they had br[illegible] with them the queen's litter for her.' She was so ill [illegible] ever that it was not till the fourth night that she re[illegible] Highgate. Here, says Fox, 'she being very sick, ta[illegible] that night and the next day; during which time o[illegible] abode there came many pursuivants and messenge[illegible] the court, but for what purpose I cannot tell.' W[illegible] entered London great multitudes of people came [illegible] about her litter, which she ordered to be opened t[illegible] herself. The city was at this time covered with g[illegible] fifteen had been erected in different places, on wh[illegible] two persons were hanged; and it appears to have be[illegible] general belief that Elizabeth would suffer, as Lady J[illegible] Grey had done a few days before. From the time of [illegible] arrival in town she was kept in close confinem[illegible] Whitehall. It appears that her case was twice deb[illegible] council; and although no evidence had been obtained by all the exertions of the crown lawyers which went farther than to make it probable that Wyatt and Courtenay had solicited her to give her assent to their projects of revolt, her immediate destruction was strongly advised by some of the ministers. Elizabeth long afterwards used to declare that she fully expected death, and that she knew her sister thirsted for her blood. It was at last determined however that for the present she should only be committed to the Tower, although she seems herself still to have been left in doubt as to her fate. She was conveyed to her prison by water on the morning of the 17th of March, being Palm Sunday, orders being issued that, in the mean time, 'every one should keep the church and carry their palms.' In attempting to shoot the bridge the boat was nearly swamped. She at first refused to land at the stairs leading to the Traitor's Gate; but one of the lords with her told her she should have no choice; 'and because it did then rain,' continues Fox, 'he offered to her his cloak, which she (putting it back with her hand with a good dash) refused. So she coming out, having one foot upon the stair, said, "Here landeth as true a subject as ever landed at these stairs; and before thee, O God, I speak it, having none other friends but thee alone."' She remained in close custody for about a month, after which she was allowed to walk in a small garden within the walls of the fortress. On the 19th of May she was removed, in charge of Sir Henry Bedingfield, to Woodstock. Here she was guarded with great strictness and severity by her new jailer. Camden says that at this time she received private letters both from Henry II. of France, inviting her to that country, and from Christian III. of Denmark (who had lately embraced the Protestant religion), soliciting her hand for his son Frederick. When these things came to the ears of her enemies, her life was again threatened. 'The Lady Elizabeth,' adds the historian, 'now guiding herself as a ship in blustering weather, both heard divine service after the Romish manner, and was frequently confessed; and at the pressing instance and menaces of Cardinal Pole, professed herself, for fear of death, a Roman Catholic. Yet did not Queen Mary believe her.' She remained at Woodstock till April, 1555, when she was, on the intercession, as it was made to appear, of King Philip, allowed to take up her residence at the royal palace of Hatfield, under the superintendence of a Catholic gentleman, Sir Thomas Pope, by whom she was treated with respect and kindness. Philip was anxious to have the credit of advising mild measures in regard to the princess, and perhaps he was really more disposed to treat her with indulgence than his wife. According to Camden, some of the Roman Catholic party wished to remove her to a distance from England, and to marry her to Emanuel Philibert, duke of Savoy; but Philip opposed this scheme, designing her for his eldest son Charles (the unfortunate Don Carlos). Elizabeth also was herself averse to a marriage with the Savoyard.

She continued to reside at Hatfield till the death of Mary, which took place on the 17th November, 1558. The news was communicated the same day, but not till after the lapse of some hours, to the House of Lords, which was sitting at the time. 'They were stunned at first,' says Heylin (or rather his translator), 'with a mighty grief and surprise, but soon wore off those impressions, and, with an handsome mixture of joy and sorrow, upon the loss of a deceased and the prospect of a succeeding princess, they betook themselves to public business, and, with one consent, agreed that the Lady Elizabeth should be declared the true and lawful heir of the kingdom according to the act of succession made 35 Henry VIII.' It is probable that Elizabeth's outward compliance in the matter of religion had considerable effect in producing this unanimity, for the majority of the lords were Catholics, and certainly both the bishops and many of the lay peers would have been strongly inclined to oppose her accession if they had expected that she would attempt to disturb the established order of things. The members of the lower house were now called up and informed of what had been done by Archbishop Heath, the chancellor. He concluded by saying that, since no doubt could or ought to be made of the Lady Elizabeth's right of succession, the House of Peers only wanted their consent to proclaim her queen. A vote to that effect immediately passed by acclamation; and, as soon as the houses rose, the proclamation took place. Elizabeth came to London on Wednesday, the 23rd; she was met by all the bishops in a body at Highgate and escorted by an immense multitude of people of all ranks to the metropolis, where she took up her lodgings at the residence of Lord North, in the Charter House. On the afternoon of Monday the 28th she made a progress through the city in a chariot to the royal palace of the Tower; here she continued till Monday the 5th of December, on the morning of which day she removed by water to Somerset House.

One of Elizabeth's earliest acts of royalty, in which, as Camden remarks, she gave proof of a prudence above her years, was what we should now call the appointment of her ministers. She retained of her privy council thirteen Catholics, who had been of that of her sister, including Heath, archbishop of York and lord chancellor; William Paulet, marquis of Winchester, the lord high treasurer; Edward, Lord Clinton, the lord high admiral; and William, Lord Howard of Effingham, the lord chamberlain. But with these she associated seven others of her own religion, the most eminent of whom was the celebrated William Cecil, afterwards Lord Burleigh, whom she appointed to the office of secretary of state, which he had already held under Edward VI. Soon after, Nicholas Bacon (the father of the great chancellor) was added to the number of the privy councillors, and made at first lord privy seal, and next year lord keeper of the great seal, on the resignation of Archbishop Heath. Cecil became lord high treasurer on the death of the marquis of Winchester in 1572, and continued to be Elizabeth's principal adviser till his death in 1598, when he was succeeded by Thomas Sackville, Lord Buckhurst (afterwards made earl of Dorset by James I.). Of the other persons who served as ministers during Elizabeth's long reign, by far the most worthy of note were Sir Francis Walsingham (who was principal secretary of state from 1573 till his death in 1590, and was all the time they were in office together the confidential friend and chief assistant of Cecil the premier, under whose patronage he had entered public life), and Burleigh's son, Robert Cecil (afterwards earl of Salisbury), who succeeded Walsingham as secretary of state, and held that office till the end of the reign. Among the other persons of ability that were employed in the course of the reign, in different capacities, may be mentioned Sir Nicholas Throckmorton ('a man,' says Camden, 'of a large experience, piercing judgment, and singular prudence, who discharged several embassies with a great deal of diligence and much to his praise, yet could he not be master of much wealth, nor rise higher than to those small dignities (though glorious in title) of chief cupbearer of England and chamberlain of the Exchequer; and this because he acted in favour of Leicester against Cecil, whose greatness he envied;' Sir Thomas Smith, the learned friend of Cheke, who had been one of the secretaries of state along with him under Edward VI., and held the same office again under Elizabeth for some years before his death, in 1577; and Sir Christopher Hatton, who was lord chancellor from 1587 till his death in 1591, and whom Camden, after having related his singular rise from being one of the band of gentlemen pensioners, to which he was appointed by the queen, who was taken with his handsome shape and elegant dancing at a court masque, characterises as 'a great patron of learning and good sense, and one that managed that weighty part of lord chancellor with that equity and clearness of principle as to be able to satisfy his conscience and the world too.'

The affair to which Elizabeth first applied her attention on coming to the throne, and that in connexion with which all the transactions of her reign must be viewed, was the settlement of the national religion. The opinions of Cecil strongly concurred with her own in favour of the reformed doctrines to which also undoubtedly the great mass of the people was attached. For a short time however she kept her intentions a secret from the majority of the council, taking her measures in concert only with Cecil and the few others who might be said to form her cabinet. She began by giving permission, by proclamation, to read part of the church service in English, but at the same time strictly prohibited the addition of any comments, and all preaching on controversial points. This however was enough to show the Catholic party what was coming; accordingly, at her coronation, on the 15th January, 1559, the bishops in general refused to assist, and it was with difficulty that one of them, Oglethorp of Carlisle, was prevailed upon to set the crown on her head. The principal alterations were reserved to be made by the parliament, which met on the 25th of that month. Of the acts which were passed, one restored to the crown the jurisdiction established in the reign of Henry VIII. over the estate ecclesiastical and spiritual, and abolished all foreign powers repugnant to the same; and another restored the use of King Edward's book of common prayer, with certain alterations, that had been suggested by a royal commission over which Parker (afterwards archbishop of Canterbury) presided. In accordance with this last statute public worship began to be performed in English throughout the kingdom on Whitsunday, which fell on the 8th of May. By a third act the first fruits and tenths of benefices were restored to the crown; and by a fourth, her majesty was authorized, upon the avoidance of any archbishopric or bishopric, to take certain of the revenues into her own hands; and conveyances of the temporalities by the holder for a longer term than twenty-one years or three lives were made void. The effect of these laws was generally to restore the church to the state in which it was in the reign of Edward VI., the royal supremacy sufficing for such further necessary alterations as were not expressly provided for by statute. A strong opposition was made to the bills in the House of Lords by the bishops; and fourteen of them, being the whole number, with the exception of Anthony, bishop of Llandaff, who, Camden says, 'was the scourge of his diocese,' were now deprived for refusing to take the oath of supremacy. About 100 prebendaries, deans, archdeacons, and heads of colleges, were also ejected. The number of the inferior clergy however that held out was very small, amounting to no more than 80 rectors and other parochial ministers, out of between nine and ten thousand. On this subject it is only necessary farther to state that the frame of ecclesiastical polity now set up, being in all essential particulars the same that still subsists, was zealously and steadily maintained by Elizabeth and her ministers to the end of her reign. The church of England has good reason to look upon her and Cecil as the true planters and rearers of its authority. They had soon to defend it against the Puritans on the one hand, as well as against the Catholics on the other; and they yielded to the former as little as to the latter. The Puritans had been growing in the country ever since the dawn of the Reformation; but they first made their appearance in any considerable force in the parliament which met in 1570. At first their attempts were met on the part of the crown by evasive measures and slight checks; but, in 1587, on four members of the House of Commons presenting to the house a bill for establishing a new Directory of public worship, Elizabeth at once gave orders that they should be seized and sent to the Tower, where they were kept some time. The High Commission Court also, which was established by a clause in one of the acts for the settlement of religion passed in the first year of her reign, was, occasionally at least, prompted or permitted to exercise its authority in the punishment of what was called heresy, and in enforcing uniformity of worship with great strictness. The determination upon which the queen acted in these matters, as she expressed it in a letter to the archbishop of Canterbury, was, 'that no man should be suffered to decline either to the left or to the right hand, from the drawn line limited by authority, and by her laws and injunctions.' Besides the deprivation of their livings, which many of the clergy underwent for their refusal to comply with certain particulars of the established ritual, many other persons suffered imprisonment for violations of the statute of uniformity. It was against the Catholics however that the most severe measures were taken. By an act passed in 1585 (the 27 Eliz. c. 2) every Jesuit or other popish priest was commanded to depart from the realm within forty days, on pain of death as a traitor, and every person receiving or relieving any such priest was declared guilty of felony. Many priests were afterwards executed under this Act.

It was the struggle with popery that moved and directed nearly the whole policy of the reign, foreign as well as domestic. When Elizabeth came to the throne, she found the country at peace with Spain, the head of which kingdom had been her predecessor's husband, but at war with France, the great continental opponent of Spain and the Empire. Philip, with the view of preserving his English alliance, almost immediately after her accession, offered himself to Elizabeth in marriage; but, after deliberating on the proposal, she determined upon declining it, swayed by various considerations, and especially, as it would appear, by the feeling that by consenting to marry her sister's husband on a dispensation from the pope, she would in a manner be affirming the lawfulness of her father's marriage with Catharine of Aragon, the widow of his brother Arthur, and condemning his subsequent marriage with her own mother, the sole validity of which rested on the alleged illegality of that previous connexion. A general peace, however, comprehending all the three powers, and also Scotland, was established in April, 1559, by the treaty of Cateau Cambresis. By this treaty it was agreed that Calais, which had been taken by France in the time of Queen Mary, and formed the only difficult subject of negotiation, should be restored to England in eight years, if no hostile act should be committed by Elizabeth within that period. Scarcely however had this compact been signed when the war was suddenly rekindled, in consequence of the assumption by the new French king, Francis II., of the arms and royal titles of England, in right, as was pretended, of his wife, the young Mary, queen of Scots. Elizabeth instantly resented this act of hostility by sending a body of 5000 troops to Scotland, to act there with the duke of Chatelherault and the lords of the congregation, as the leaders of the Protestant party called themselves, against the government of the queen and her mother, the Regent, Mary of Guise. The town of Leith soon yielded to this force; and the French king was speedily compelled both to renounce his wife's pretensions to the English throne and to withdraw his own troops from Scotland, by the treaty of Edinburgh, executed 7th July, 1560. The treaty however never was ratified either by Francis or his queen; and in consequence the relations between the three countries continued in an unsatisfactory state. Charles IX. succeeded his brother on the throne of France before the end of this year; and in a few months afterwards Mary of Scotland returned to her own country. Meanwhile, although the two countries continued at peace, Elizabeth's proceedings in regard to the church had wholly alienated Philip of Spain. The whole course of events and the position which she occupied had already in fact caused the English queen to be looked upon as the head of the Protestant interest throughout Europe as much as she was at home. When the dispute therefore between the Catholics and the Huguenots or reformed party in France came to a contest of arms, in 1562, the latter immediately applied for assistance to Elizabeth, who concluded a treaty with them, and sent them succour both in men and money. The war that followed produced no events of importance in so far as England was concerned, and was terminated by a treaty signed at Troyes, 11th April, 1564. A long period followed, during which England preserved in appearance the ordinary relations of peace both with France and Spain, though interferences repeatedly took place on each side that all but amounted to actual hostilities. The Protestants alike in Scotland, in France, and in the Netherlands (then subject to the dominion of Philip), regarded Elizabeth as firmly bound to their cause by her own interests; and she on her part kept a watchful eye on the religious and political contentions of all these countries, with a view to the maintenance and support of the Protestant party, by every species of countenance and aid short of actually making war in their behalf. With the Protestant government in Scotland, which had deposed and imprisoned the queen, she was in open and intimate alliance; in favour of the French Huguenots she at one time negotiated or threatened, at another even went the length, scarcely with any concealment, of affording them pecuniary assistance; and when the people of the Netherlands at length rose in revolt against the oppressive government of Philip, although she refused the sovereignty of their country, which they offered to her, she lent them money, and in various other ways openly expressed her sympathy and good will. On the other hand, Philip, although he refrained from any declaration of war, and the usual intercourse both commercial and political long went on between the two countries without interruption, was incessant in his endeavours to undermine the throne of the English queen and the order of things at the head of which she stood, by instigating plots and commotions against her authority within her own dominions. He attempted to turn to account in this way the Catholic interest, which was still so powerful both in England and in Ireland—the intrigues of the Scottish queen and her partizans materially contributing to the same end. The history of Mary Stewart and of the affairs of Scotland during her reign and that of her son must be reserved for a separate article. But it is necessary to observe here, that Mary was not merely the head of

Catholic party in Scotland, but as the descendant of the eldest daughter of Henry VII., had pretensions to the English crown which were of a very formidable kind. Although she was kept in confinement by the English government after her flight from the hands of her own subjects in 1568, the imprisonment of her person did not extinguish the hopes or put an end to the efforts of her adherents. Repeated rebellions in Ireland, in some instances openly aided by supplies from Spain—the attempt made by the duke of Alva in 1569, through the agency of Vitelli, to concert with the Catholic party the scheme of an invasion of England—the rising of the Catholics of the northern counties under the earls of Northumberland and Westmoreland the same year—the plot of the duke of Norfolk with Ridolfi in 1571, for which that unfortunate nobleman lost his head—the plots of Throgmorton and Creichton in 1584, and of Babington in 1586—to omit several minor attempts of the same kind—all testified the restless zeal with which the various enemies of the established order of things pursued their common end. Meanwhile, however, events were tending to a crisis which was to put an end to the outward show of friendship that had been so long kept up between parties that were not only fiercely hostile in their hearts, but had even been constantly working for each other's overthrow behind the thin screen of their professions and courtesies. The queen of Scots was put to death in 1587, by an act of which it is easier to defend the state policy than either the justice or the legality. By this time also, although no actual declaration of war had yet proceeded either from England or Spain, the cause of the people of the Netherlands had been openly espoused by Elizabeth, whose general, the earl of Leicester, was now at the head of the troops of the United Provinces, as the revolted states called themselves. An English fleet at the same time attacked and ravaged the Spanish settlements in the West Indies. At last, in the summer of 1588, the great Spanish fleet, arrogantly styled the Invincible Armada, sailed for the invasion of England, and was in the greater part dashed to pieces on the coasts which it came to assail. [Armada.] From this time hostilities proceeded with more or less activity between the two countries during the remainder of the reign of Elizabeth. Meanwhile Henry III., and, after his assassination in 1589, the young king of Navarre, assuming the title of Henry IV., at the head of the Huguenots, had been maintaining a desperate contest in France with the duke of Guise and the League. For some years Elizabeth and Philip remained only spectators of the struggle; but at length they were both drawn to take a principal part in it. The French war, however, in so far as Elizabeth was concerned, must be considered as only another appendage to the war with Spain; it was Philip chiefly, and not the League, that she opposed in France; just as in the Netherlands, and formerly in Scotland, it was not the cause of liberty against despotism, or of revolted subjects against their legitimate sovereign, that she supported, or even the cause of Protestantism against Catholicism, but her own cause against Philip, her own right to the English throne against his, or that of the competitor with whom he took part. Since the death of Mary of Scotland, Philip professed to consider himself as the rightful king of England, partly on the ground of his descent from John of Gaunt, partly in consequence of Mary having by her will bequeathed her pretensions to him should her son persist in remaining a heretic. Henry IV. having previously embraced Catholicism, made peace with Philip by the treaty of Vervins, concluded in May, 1598; and the death of Philip followed in September of the same year. But the war between England and Spain was nevertheless still kept up. In 1601 Philip III. sent a force to Ireland, which landed in that country and took the town of Kinsale; and the following year Elizabeth retaliated by fitting out a naval expedition against her adversary, which captured some rich prizes, and otherwise annoyed the Spaniard. Her forces continued to act in conjunction with those of the Seven United Provinces both by sea and land.

Elizabeth died on the 24th of March, 1603, in the 70th year of her age and the 45th of her reign. In the very general account to which we have necessarily confined ourselves of the course of public transactions during the long period of the English annals with which her name is associated, we have omitted all reference to many subordinate particulars, which yet strongly illustrate both her personal conduct and character and the history of her government. One of the first requests addressed to her by the parliament after she came to the throne was that she would marry; but for reasons which were probably various, though with regard to their precise nature we are rather left to speculation and conjecture than possessed of any satisfactory information, she persisted in remaining single to the end of her days. Yet she coquetted with many suitors almost to the last. In the beginning of her reign, among those who aspired to her hand, after she had rejected the offer of Philip of Spain, were Charles, archduke of Austria (a younger son of the Emperor Ferdinand I.); James Hamilton, earl of Arran, the head of the Protestant party in Scotland; Erick XIV., king of Sweden (whom she had refused in the reign of her sister Mary); and Adolphus, duke of Holstein (uncle to Ferdinand II. of Denmark). 'Nor were there wanting at home,' adds Camden, 'some persons who fed themselves (as lovers use to do) with golden dreams of marrying their sovereign;' and he mentions particularly Sir William Pickering, 'a gentleman well born, of a narrow estate, but much esteemed for his learning, his handsome way of living, and the management of some embassies into France and Germany;' Henry earl of Arundel; and Robert Dudley (afterwards the notorious earl of Leicester), a younger son of the duke of Northumberland, 'restored by Queen Mary to his honour and estate; a person of youth and vigour, and of a fine shape and proportion, whose father and grandfather were not so much hated by the people, but he was as high in the favour of Queen Elizabeth, who out of her royal and princely clemency heaped honours upon him, and saved *his* life whose father would have destroyed *hers*.' Leicester continued the royal favourite till his death in 1588, disgracing by his profligacy the honours and grants that were lavished upon him by Elizabeth, who, having appointed him commander-in-chief of the forces which she sent to the assistance of the Dutch, insisted upon maintaining him in that situation, notwithstanding the mischiefs produced by his incapacity and misconduct, and, at the perilous crisis of the Spanish invasion, was on the point of constituting him lieutenant-governor of England and Ireland. Camden says that the letters patent were already drawn, when Burghley and Hatton interfered, and put a stop to the matter. Of the foreign princes that have been mentioned, the archduke Charles persisted longest in his suit: a serious negotiation took place on the subject of the match in 1567, but it came to nothing. In 1571 proposals were made by Catherine de' Medici for a marriage between Elizabeth and her son Charles IX., and afterwards in succession with her two younger sons, Henry duke of Anjou (afterwards Henry III.), and Francis duke of Alençon (afterwards duke of Anjou). The last match was again strongly pressed some years after; and in 1581 the arrangement for it had been all but brought to a conclusion, when, at the last moment, Elizabeth drew back, declining to sign the marriage articles after she had taken up the pen for the purpose. Very soon after the death of Leicester the young Robert Devereux, earl of Essex, whose mother Leicester had married, was taken into the same favour that had been so long enjoyed by the deceased nobleman; and his tenure of the royal partiality lasted, with some intermissions, till he destroyed himself by his own hot-headedness and violence. He was executed for a frantic attempt to excite an insurrection against the government in 1601. Elizabeth, however, never recovered from this shock; and she may be said to have sealed her own sentence of death in signing the death-warrant of Essex.

Both the personal character of Elizabeth and the character of her government have been estimated very differently by writers of opposite parties. That she had great qualities will hardly be disputed by any one who duly reflects on the difficulties of the position she occupied, the consummate policy and success with which she directed her course through the dangers that beset her on all sides, the courage and strength of heart that never failed her, the imposing attitude she maintained in the eyes of foreign nations, and the admiration and pride of which she was the object at home. She was undeniably endowed with great good sense, and with a true feeling of what became her place. The weaknesses, and also the more forbidding features of her character, on the other hand, are so obvious as scarcely to require to be specified. Many of the least respectable mental peculiarities of her own sex were mixed in her with some of the least attractive among those of the other. Her selfishness and her vanity were both intense—and of the sympathetic affections and finer sensibilities of every kind she was nearly destitute.

Her literary knowledge was certainly very considerable; but of her compositions (a few of which are in verse) none are of much value, nor evidence any very superior ability, with the exception perhaps of some of her speeches to the parliament. A list of the pieces attributed to her may be found in Walpole's 'Royal and Noble Authors.'

There has been a good deal of controversy as to the proportion in which the elements of liberty and despotism were combined in the English constitution, or in the practice of the government, in the reign of Elizabeth; the object of one party being to convict the Stewarts of deviating into a new course in those exertions of the prerogative and that resistance to the popular demands which led to the civil wars of the seventeenth century,—of the other, to vindicate them from that charge, by showing that the previous government of Elizabeth had been as arbitrary as theirs. Upon this question the reader may consult the elaborate exposition with which Hume closes his account of this reign, along with the remarks upon it in the Introduction to Mr. Brodie's 'History of the British Empire, from the Accession of Charles I. to the Restoration.' There can be no doubt that the first James and the first Charles pursued their object with much less art, and much less knowledge and skill in managing the national character, as well as in less advantageous circumstances, than Elizabeth and her ministers; they did not know nearly so well when to resist and when to yield as she did; but it may notwithstanding be reasonably questioned if her notion of the rightful supremacy of the crown was very different from theirs. However constitutional also (in the modern sense of the term) may have been the general course of her government, her occasional practice was certainly despotic enough. She never threw aside the sword of the prerogative, although she may have usually kept it in its scabbard.

Her reign, however, take it all in all, was a happy as well as a glorious one for England. The kingdom, under her government, acquired and maintained a higher and more influential place among the states of Europe, principally by policy, than it had ever been raised to by the most successful military exertions of former ages. Commerce flourished and made great advances, and wealth was much more extensively and more rapidly diffused among the body of the people than at any former period. It is the feeling of progress, rather than any degree of actual attainment, that keeps a nation in spirits; and this feeling every thing conspired to keep alive in the hearts of the English in the age of Elizabeth; even the remembrance of the stormy times of their fathers, from which they had escaped, lending its aid to heighten the charm of the present calm. To these happy circumstances of the national condition was owing, above all, and destined to survive all their other products, the rich native literature, more especially in poetry and the drama, which now rushed up, as if from the tillage of a virgin soil, covering the land with its perennial fruit and flowers. Spenser and Shakspeare, Beaumont and Fletcher, Raleigh and Bacon, and many other distinguished names, gained their earliest celebrity in the Elizabethan age.

ELIZABETH PETROWNA, daughter of Peter the Great and of Catherine I., was born in the year 1709. After the death of her nephew, Peter II., in 1730, she was urged to assert her claims to the crown, but she declined to do so through indolence or timidity, and her cousin Anna, duchess of Courland, was raised to the throne. After the death of Anna in 1740, Iwan, the infant son of the duke of Brunswick and of Ann, niece to the late empress, was proclaimed emperor under the tutelage of his mother, in conformity to the will of the defunct sovereign. A conspiracy however was soon after hatched by some of Elizabeth's attendants, especially a surgeon of the name of Lestoq, who found great difficulty in conquering her irresolution: the officers of the guards were drawn into the plot, and a military insurrection followed in 1741, when Elizabeth was proclaimed empress, and Ann and her husband, the duke of Brunswick, and the child Iwan, were put in confinement. Several noblemen were sent into Siberia. Bestucheff, who had been minister under the Empress Anna, was retained in office and appointed chancellor. Elizabeth took an active part in the war of the Austrian succession, and sent troops to the assistance of Maria Theresa, and she afterwards concurred in the peace of Aix la Chapelle in 1748. During the Seven Years' War, Elizabeth took part against Frederick of Prussia, it was said, from personal p[illegible] at some sarcastic reflections of the Prussian king. The Russian army invaded Prussia, won the hard-fought battle of Kunnersdorf, crossed the Oder, entered Berlin, and reduced Frederick to the verge of ruin and despair. But the illness and death of Elizabeth soon retrieved his fortunes. She died in December, 1761, after a reign of twenty years. She was succeeded by the duke of Holstein Gottorp, son of her sister Anna Petrowna, duchess of Holstein: he assumed the title of Peter III.

The government of Elizabeth was directed in great measure by favorites, who succeeded one another. The empress herself was good-natured and even amiable, but indolent and sensual, and many acts of oppression and cruelty were perpetrated under her reign. She was averse to the punishment of death, but numerous persons were sentenced to the knout and to exile in Siberia. Several ladies, among others Madame Lapoukin, a handsome and clever woman, who had given offence to Elizabeth, experienced the same fate. Elizabeth exerted herself to forward the compilation of a code of laws for the Russian empire, a task begun under Peter the Great, but which was not completed till the reign of Catherine II. She was never married, but left several natural children.

ELIZABETHGRAD or YELISAVETGRAD, a circle in the northern part of the province of Cherson, and in the south of Russia in Europe, lying between 47° 30′ and 49° 4′ N. lat., and 30° 50′ and 33° 8′ E. long. It is bounded on the north by Kieff, on the south by Cherson, and on the west by Podolia. According to Georgi, Elizabethgrad contains 696,490 acres of land fit for the plough, 43[illegible] of meadows and pastures, and 24,330 of woods and forests. The forests principally consist of pines, occasionally intermixed with limes and beeches. The surface in the northern districts is traversed by a branch of the mountains of the Dnieper, where there are extensive forests, such as the Tshuta, Tshernoylesz, &c. The remaining part of the circle is a steppe. On the whole the soil is rich and fertile, but most cultivated in the north. It produces much grain, and saffron grows in a wild state. The Ingul is the principal river in the circle. It contains one town, and about [illegible] villages and hamlets. Wild beasts, particularly bears, in the south wild horses abound: game is plentiful. There are many quarries of millstones, which form a considerable article of export. The population is about 35,000.

ELIZABETHGRAD, the chief town of the circle, in 48° 30′ N. lat., and 32° 28′ E. long., in a beautiful plain on the banks of the Ingul. It is of an hexagonal shape, defended by six bastions, and was built in 1754. The [illegible] and a large arsenal are situated within its walls; but it has besides four suburbs; the whole is regularly built, and has straight broad streets, planted with avenues of trees. There are five churches, a large hospital, numerous magazines, above 1000 houses, and about 12,000 inhabitants, many of whom are Greeks or of Servian origin; but the majority are Rostolnicks, who observe the rites of the primitive Russo-Greek church. The inhabitants depend much upon a large traffic in the produce of the neighbouring provinces, and carry on considerable trade with Poland and Moldavia. There is an annual fair at Elizabethgrad, which being the largest in the whole province of Cherson, is attended by many thousand dealers and others. There are no less than thirty-two windmills round the town.

ELK. [DEER, vol. viii. p. 351.]

ELL (Ulna), a measure of length now almost disused. 'It is properly,' says Ducange, 'the length between the ends of both the extended hands, though Suetonius makes it to be only one cubit.' It is not worth while to attempt to follow a measure of secondary importance through its various changes, and this measure in particular has denoted very different lengths in different countries. The three ells which have preserved a place in our arithmetical works, namely the Flemish, English, and French ells, are respectively three, five, and six quarters of a yard.

ELLAGIC ACID. This acid exists in the gall-nut along with gallic acid; and they separate from the aqueous solution in the state of a yellowish crystalline mass. They are separated by boiling water, which dissolves the gallic, and leaves the ellagic unacted upon, but mixed with a little gallate of lime. By treatment with a weak solution of potash the ellagic acid is dissolved, and the gallate of lime pressure [illegible]; the ellagate of potash is then treated with hydrochloric acid, which uniting with the potash, precipitates the ellagic acid in a pulverulent state.

The properties of this acid are the following: It is of a light fawn colour. It is insipid, slightly soluble in boiling water, and reddens litmus paper slightly. When heated in close vessels it decomposes, yielding a yellow vapour, which condenses in crystals of the same colour. This acid becomes of a blood-red colour by digestion in nitric acid, and is converted afterwards into oxalic acid. It unites with potash, soda, and ammonia to form neutral salts; the two first are insoluble in water, except when an excess of base is present; and the ellagate of ammonia does not dissolve under any circumstances. Its acid powers are weak, for it is incapable of decomposing the alkaline carbonates.

It is composed of

Two equivalents of hydrogen	. .	2	or	2·6
Seven ,, carbon	. .	42		55·3
Four ,, oxygen	. .	32		42·1
Equivalent		76		100

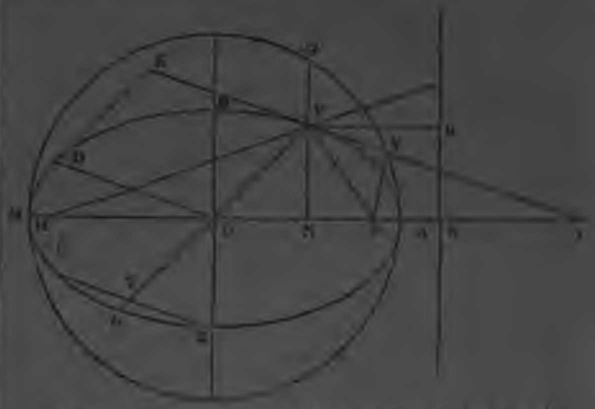
ELLEBORIN, a resin, of an extremely acrid taste, which has been found in the *Helleborus hyemalis*. It is obtained by making a tincture of the root with alcohol, and subjecting it to distillation, when the elleborin remains in the state of a nearly white mass, which is soft and granular, and readily melts into an oily fluid. Its taste is extremely acrid, but it has no smell; it dissolves in alcohol, and imparts to it a red-brown colour; it is but little dissolved by water; the spirituous solution precipitates the persalts of iron of a purple colour.

ELLENBOGEN, ELNBOGEN, or ELBOGEN, the most westerly circle of the Kingdom of Bohemia, bounded on the north by Saxony, and on the west by Bavaria, consists of four districts: Ellenbogen (nine-tenths of the whole circle), Eger, Asch, and the small territory of the Frais in the south-west. Its area is about 1180 square miles, and it has 27 towns, 12 market-villages, 801 villages and hamlets, and about 270,300 inhabitants; in 1846, 189,427. The great range of the Bohemian Ore mountains (Erzgebirge), which separate it on the north and west from Saxony and Bavaria, spreads its branches over every part but the south-east; between these offsets are numerous small fertile plains and many large valleys. The principal streams are the Eger, which traverses it from south-west to north-east, the Tepl and Strela in the south, and the Zwoda and Wondreb in the north. The forests produce good timber, flax, but on the whole neither the soil nor climate is well adapted for agriculture; mining, manufactures, and a brisk trade are the chief occupations of the people. The principal natural productions are silver, tin, lead, iron, sulphur, alum, and saltpetre; and there are several valuable mineral springs, such as those of Carlsbad, Franzensbrunnen (near Eger), Sedlitz, &c. The chief manufactures consist of woollens, cottons, stockings and hosiery, paper, and iron and steel wares; and nearly three-fourths of the Bohemian lace are made in this circle. Ellenbogen (2100 inhabitants), Carlsbad, Joachimsthal (a mining town of 4480 inhabitants in the north-east), Weipert (3600), Graslitz (4700), a manufacturing town, Königsberg (1800), Schlaggenwald (2200), Schönfeld (2530), and Schönbach (2230), are the principal towns in the district of Ellenbogen; in that of Eger are Eger, Franzensbrunnen or Egerbrunnen, and Wildstein and Haslau, manufacturing places. In that of Asch are Asch, the chief town, which has considerable manufactures, and about 5600 inhabitants, and Rossbach, a manufacturing place.

ELLESMERE. [SHROPSHIRE.]

ELLICHPORE, a principal city in the province of Berar, in 21° 13′ N. lat. and 77° 36′ E. long. It is only in part surrounded by a wall, and is not a place of any strength. It lies in the Dooab, between the Sarpun and the Beechun rivers, which form a junction near Ellichpore, and afterwards fall into the Poorna. This city is held, together with a small surrounding territory, by a petty chief, who is nominally dependent upon the Nizam, but is under the protection of the English. The palace of the chief is a handsome and commodious building, and the bazaar and houses in its vicinity are built of brick, but the rest of the city consists of mud houses, and has a very mean appearance. Ellichpore is 125 miles from Nagpore, 310 miles from Hyderabad, 590 miles from Delhi, 761 from Madras, and 844 miles from Calcutta, all travelling distances.

ELLIPSE (ἔλλειψις). This curve, which is one of the CONIC SECTIONS, ranks next in importance to the circle (which is itself an extreme form of the ellipse) and the straight line. We shall here consider the ellipse independently of the other conic sections, and simply state some of the most remarkable properties which can be exhibited without algebraical symbols.



1. Let any two points S and H be taken, and their distance bisected in C. Set off CA and CM, equal lines, each greater than CS, and let a point P move in such a manner that HP and PS together are always equal to AM. The curve described by the point P is an ellipse.

2. CA is called the *semi-axis major*, CB the *semi-axis minor*, C the *centre*, S and H the *foci*, SP and HP the *focal distances* of the point P, CP the *semi-diameter* of the point P, and CD (drawn parallel to the tangent PT) the *conjugate semi-diameter*, or *semi-conjugate* of CP. Also the fraction which CS is of CA is called the *eccentricity* of the ellipse.

3. Let SA be to AK as CS to CA. Then KR is called the *directrix* of the ellipse, and SP is to PR as SA to AK.

4. The tangent PT bisects the angle made by SP and the continuation of HP.

5. CA is a mean proportional between CN and CT.

6. If, A and M remaining the same, the figure of the ellipse be altered by varying S and H, the tangents drawn through the several points at which the ellipses cut NQ will all pass through the same point T of the axis. The circle AQM is the extreme form of the ellipse, when S and H meet in C, and the tangent at Q passes through T.

7. Wherever the point P may be taken, NP bears to NQ the same proportion as CB to CA, and so does the area ANP to the area ANQ.

8. The perpendicular let fall from S upon PT must cut it in a point of the circle AQM.

9. If CD be parallel to the tangent at P, then CP is parallel to the tangent at D.

10. The parallelogram PCDK is equal to the rectangle of BC and CA, and the sum of the squares on PC and CD is equal to the sum of the squares on AC and CB.

11. The square on PN is *less* than the rectangle contained by AN and NM in the proportion of the square on CB to the square on CA. From this *deficiency* the ellipse derives its name, as does the HYPERBOLA (ὑπερβολή) from a corresponding excess.

12. PC bisects every line parallel to CD which is bounded at both ends by the ellipse, and the square on XY is to the rectangle contained by GY and YG′ in the proportion of the square on CD to that on CP.

13. The square on CD is equal to the rectangle contained by SP and PH.

Such are a few of the countless properties which might be exhibited. But it is to be noticed that the most common and elegant theorems are not those which are found most useful. The striking use of this curve lies in its being the nearest representative of a planetary orbit which can be given in a simple manner. If the planets did not attract each other, but were only attracted by the sun, they would describe absolute ellipses. Their mutual actions being small, compared with that which the sun exerts, they consequently move in ellipses *very nearly*. Hence the utility of the ellipse in astronomy: but at the same time the properties of the curve which facilitate the investigation of the heavenly motions present nothing so striking as those which we have given.

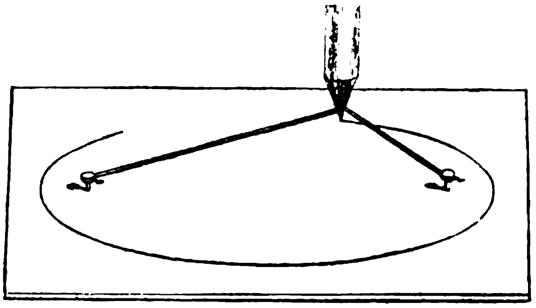
The reader who is not versed in geometry must remember that though an ellipse be an *oval*, yet an oval is not necessarily an ellipse. A figure may be formed by arcs of circles which shall have the appearance of an ellipse, without possessing any of its properties.

ELLIPSOID. [Surfaces of the Second Degree.] See also Spheroid for the most useful part of the subject.

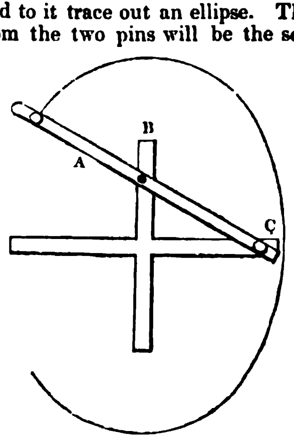
ELLIPSOLITES. [Cornu Ammonis, vol. viii. p. 26.]

ELLIPSOSTO'MATA. M. de Blainville's name for a family (the third) of his second order, *Asiphonobranchiata*, of his first sub-class, *Paracephalephora Dioica*, of his second class, *Paracephalophora*, of his *Malacozoa*. The *Ellipsostomata* of De Blainville comprehend the genera *Melania, Rissoa, Phasianella, Ampullaria, Helicina* (including *Ampulleira* De Blainv. and *Olygira*, Say), and *Pleurocerus*. Of these all but *Pleurocerus* are included under the Pectinibranchiate Gasteropods of Cuvier; and as the habits of the included genera are by no means uniform, the genera will be treated of under their several titles. For Ampullaria see vol. i. p. 473.

ELLIPTIC COMPASSES, the name given to any machine for describing an ellipse. We shall only mention two contrivances of the kind out of a large number which have been proposed. The first is the simple and rough method suggested by the first property in the article Ellipse. Let two pins be fastened to the paper at the points in which the foci are to lie, and let a thread, equal in length to the proposed major axis, have one end tied to each pin. Then if a pencil move in such a way as to keep the thread always stretched, it will describe an ellipse.



The second method is as follows: it is known that if any two fixed points in a straight line A be made to move along two other straight lines, B and C, then every other point in A will describe an ellipse. If then two grooves be made (at right angles to each other, for convenience), and if two pins attached to a ruler be made to travel in the grooves, the motion of the ruler will make any pencil attached to it trace out an ellipse. The distances of the pencil from the two pins will be the semiaxes of the ellipse. If the pins be attached to the ruler by clamping screws their distance may be altered, and the instrument may be made to describe any ellipse within limits depending on the length of the ruler and of the grooves.



ELLIPTICITY, a term used in the theory of the figure of the earth. It means the fraction which the excess of the axis major over the axis minor of an ellipse is of the axis minor itself. Thus if the axis major be 9 and the axis minor 7, the ellipticity is $\frac{2}{7}$. This term must not be confounded with the *excentricity*, a word in much more mon use. If a and b be the semiaxes major and and if e be the excentricity and E the ellipticity, then

$$E=\frac{a-b}{b},\quad e=\sqrt{1-\frac{b^2}{a^2}}$$

if b and a be nearly equal, $e^2=2E$ nearly.

ELLORE, a district forming part of the collect of Musulipatam, one of the subdivisions of the Nort Circars, situated between the Krishna and Godavery r and comprising an area of about 2700 square miles ex sive of a mountainous tract on the west whose limits not been defined. The town of Ellore, which is the of residence of the Masulipatam collector, is a place of siderable size, lying in 16° 43′ N. lat. and 81° 15′ E. It is 183 miles from Hyderabad, travelling distance.

ELM. [Ulmus.]

ELMINA. [Coast, Gold.]

ELMSLEY, PETER, was born in the year 1773, educated at Westminster and Oxford. In 1798 he presented to the chapelry of Little Horkesley, in E By the death of his uncle Elmsley, the well-known seller, he succeeded to a competent fortune, which en him to live in independence, and devote his whole tim literary pursuits. For some time after his uncle's he resided in Edinburgh, and was one of the earliest tributors to the Edinburgh Review. The articles Wyttenbach's Plutarch, Schweighäuser's Athenæus, B field's Æschylus, and Porson's Hecuba are gener understood to have been written by him. While at E burgh he superintended an edition of Herodotus (6 vols. 12mo), in which he gave the first proof of the Atticisms which always distinguished him, by introdu into the text the Attic forms of the tenses, in spite of the MSS. He was also an early contributor to the 'Qu terly Review:' his paper on Markland's Euripides (in seventh volume) is well known to scholars. As soon as state of Europe permitted, Elmsley went abroad, and lated MSS. in the continental libraries. He spent the whole of the winter of 1818 in the Laurentian library Florence. In 1819 Elmsley was appointed by the govern ment to assist Sir Humphrey Davy in unrolling and de phering the papyri at Herculaneum; but the attempt not attended with success, and in the prosecution of duties Elmsley caught a fever, from which he never recovered.

On his return to Oxford he became Principal of St ban's Hall, and Camden Professor of Modern History in university. He died of a disease of the heart on the March, 1825. Elmsley's acknowledged works were ed of Greek plays. He published the Acharnians of phanes in 1809: the Œdipus Tyrannus of Sophocles in the Heracleidæ, Medea, and Bacchæ of Euripides years 1815, 1818, and 1821; and the Œdipus Colo Sophocles in 1823. His transcript of the Florentine on Sophocles was published after his death. As a Elmsley did not pretend to be more than a follow Porson, but he did far more for Greek scholarship tha English scholar who followed that great critic. His has been drawn with great truth by the celebrated G. mann of Leipzig (in the Wien. Jahrbücher, vol. liv., p. 'The way laid open by Porson was pursued and by P. Elmsley, a man worthy of all honorable mention on account of his sound scholarship, as his great and earnest love of truth. We owe to his unwear accuracy and great application a rich treasure of exc observations on the Attic dialect; and if he was too of making general rules, and for the sake of these introducing many wrong or unnecessary emendations, should remember how easily diligent observation one to form a rule, and how easily the adoption general rule inclines one to set aside all deviations it. But Elmsley had too much good sense and too a love of truth not to turn back from his error, and it only for a confirmation of the truth and a new adv on the right way: and of this he has given many pro

ELOCUTION. [Oratory.]

E'LOGE, in the French language means praise, derived from the Latin *elógium*, and that from the Gr *eulógia* (εὐλογία). It has become the name of a consider branch of French literature, which comprehends pa rical orations in honour of distinguished deceased pe It is the custom when one of the members of the Frenc other academies dies, and a new member is appointed in his place, the new member includes a panegyrical oration on the labours and other merits of his predecessor. These *Eloges* are generally printed and published, and although they are mostly written in a florid declamatory style, still many of them are really interesting biographies. Such, for example, are the *Eloges* written by Cuvier on several of his brother naturalists. [Cuvier.] The custom of writing *Eloges* of deceased persons is not confined to members of academies. Bailly wrote *Eloges de Charles V., de Molière, de Corneille, de l'Abbé de la Caille, et de Leibnitz*, Berlin, 1770. The Italians have also *Elogj degli Uomini Illustri Toscani*, 4 vols., 8vo, Firenze, 1766-73, and many other similar compositions.

ELONGATION, an astronomical term for the angular distance between two heavenly bodies as seen from the earth. Custom has confined it to the case in which both bodies are in the solar system, and one of them is generally the sun. Thus we speak of the *distance* of two fixed stars, and of the *elongation* of Mercury from the sun.

ELOQUENCE. [Oratory.]

ELORA, or **ELLORA**, a town situated near the city of Dowletabad, in 19° 58′ N. lat. and 75° 23′ E. long. This place, although it is now nearly depopulated, was once of considerable importance. The ruins surrounded by the wall of the town occupy a great space; but it is to the excavations near to the town that it owes its present celebrity. These excavations, which occur in a mountain about a mile to the east of Elora, were formerly Hindu temples of great sanctity, although they are now never visited except from curiosity. They are cut out of the solid rock, and the labour which they cost must have been prodigiously great. The largest cave, which is called the Kailas, is 247 ft. long, and 150 ft. wide. It contains sculptures of almost every deity of the Hindu mythology, and most of them of colossal size. This chamber contains the Great Temple, which is a monolith or solid piece of rock hollowed out. It is 103 ft. long, and its greatest breadth 61 ft.; its interior height is 18 ft.; but its exterior rises in a pyramidal form to the height of more than 100 feet.

There are several other large temple-caves in different parts of the mountain. Those towards the north and the south have evidently been devoted to Buddhist rites, while those in the centre have been the scenes of Brahminical worship. In different parts of the mountain there are found a great number of smaller excavations cut in the face of the rock. These are not ornamented with sculptures, and are supposed to have been the residences of the officiating priests and officers of the temples.

The Brahmins who reside on the spot assert that the whole of the caves were made by Eloo, rajah of Ellichpore, who lived upwards of 7900 years ago—an assertion incapable of proof, and which does not bear the stamp of probability. Elora being in the immediate neighbourhood of Deoghur (Deogurh), now called Dowletabad, which, previously to the Mohammedan conquest, was the metropolitan city of a powerful state, these temples were most probably constructed at various times and by different princes.

The town of Elora was acquired by the English from Holkar, but in 1822 was, together with the lands attached to it, including the mountain wherein these cave-temples are situated, made over to the Nizam in exchange for other lands situated more conveniently for the British interest. (Seely, *Wonders of Elora*, London, 1824; *Asiat. Researches*, vol. vi.)

ELPHIN, a bishop's see in the ecclesiastical province of Tuam in Ireland. The chapter consists of dean, precentor, archdeacon, and eight prebendaries. The diocese embraces the greater part of the county of Roscommon, and portions of the counties of Galway and Sligo, with one parish in Mayo county; and extends in length about fifty English miles, and in breadth from three to thirty. It contains seventy-four parishes, constituting thirty-two benefices. In 1792 there were in this diocese twenty-six churches of the establishment: in 1834 the numbers were, churches of the establishment, thirty-nine; other places of worship in connexion therewith, three; Roman Catholic chapels, eighty; Presbyterian ditto, one; other places of Protestant dissenting worship, eight. The total population of the diocese in the same year was [illegible], of whom there were [illegible] members of the established church, [illegible] Roman Catholics, 250 Presbyterians, and 126 other Protestant Dissenters, being in the proportion of nineteen Roman Catholics to one Protestant of whatever denomination, nearly. In the same year there were in this diocese 558 schools, of which fourteen were in connexion with the National Board of Education, educating 24,078 young persons, being in the proportion of 7¾ per cent. of the entire population under daily instruction; in which respect this diocese stands eighteenth among the thirty-two dioceses of Ireland.

This see was founded about the end of the 5th century, by St. Patrick, who set over it Asicus its first bishop. Asic, like many others of the primitive Irish bishops, was a distinguished worker in metals, and is said to have bequeathed to his successors several specimens of his skill, which were long preserved with great veneration. There is nothing of importance in the subsequent history of the see. Elphin, when void, is to be united to the diocese of Kilmore, by section 32 of the Church Temporalities' Act of the 3rd and 4th Wm. IV.

ELPHINSTONE, WILLIAM, founder of King's College, Aberdeen, was born at Glasgow in 1437. His father, whose name he bore, entered into holy orders on the death of his wife, and was first rector of Kirkmichael, and at length archdeacon of Teviotdale, in which station he died in 1486, being then also, as it seems, provost of the collegiate church of St. Mary's, Glasgow.

At the head of those who *in congregatione continued* the statutes of the faculty of arts in Glasgow college, on the erection of that seminary in 1451, stands the name of William Elphinstone, Dean of Faculty. This was, no doubt, the archdeacon of Teviotdale. Among those incorporated in the university the same year appears also the name "Wilmus Elphinstoun." Some* have thought this was the same individual; but it would rather seem, as the learned author of the life of Melville supposes (M'Crie's *Melv.* i. 439), that it was the youthful Elphinstone, who, it is admitted on all hands, was educated at the university of Glasgow. Here he passed A.M. probably in the 20th year of his age. (Keith's Bishops, p. 110.) Afterwards, applying himself to theology, he was made priest of St. Michael's, or Kirkmichael, Glasgow, in which place he served four years, and then proceeded to France, where, after three years' study of the laws, he was appointed professor of law, first at Paris and then at Orleans. He continued abroad till the year 1471, when he returned home at the earnest request of his friends, particularly Bishop Muirhead, who thereupon made him parson of Glasgow and official of the diocese.

On Muirhead's decease, in the end of 1473, the archbishop of St. Andrews made him official of Lothian, which he continued to be till the year 1478. In the spring of that year we find John Otterburn in the office; yet in June following Mr. Elphinstone is marked in the parliament rolls as official of Lothian, and in that capacity elected *ad causas*. He was also made a privy councillor. About the same time he was joined in an embassy to France with the earl of Buchan and the bishop of Dunblane, to compose some differences which had arisen between the two crowns; and on his return, in 1479, he was made archdeacon of Argyle, and then bishop of Ross, whence, in 1484, he was translated to the diocese of Aberdeen.

The same year, as bishop of the latter see, he was one of the commissioners from Scotland to treat of a truce and matrimonial alliance with England, whither he was again despatched as an ambassador on the accession of King Henry VII. When affairs at home came to be troubled between the king and his nobles, he took the part of the former; and when the Earl of Argyll was sent on an embassy into England, he was, on the 21st February, 1488, constituted lord chancellor of the kingdom; in which place however he continued only till the king's demise in June following. In October of the same year he was in the parliament then held at Edinburgh, where we also find him assisting at the coronation of the new king. He was afterwards sent on an embassy to Germany; and on his return thence was appointed to the office of lord privy seal, where he seems to have remained till his death, which happened at Edinburgh on the 25th October, 1514, while negotiations were pending with the court of Rome for his elevation to the primacy of St. Andrews.

Besides a book of canons, extracted out of the ancient canons, Elphinstone wrote a history of Scotland, chiefly out of Fordun. He wrote also some lives of Scotch saints; and in the college of Aberdeen are preserved several large folio volumes of his compilations on the canon law. The civil and canon laws indeed were his favourite studies, and to their establishment as the laws of Scotland he long and steadily directed his attention. It is to him we may in all probability ascribe the crafty acts 1487, c. 105, seq. to recover the former large jurisdiction of the chancellor and court of session, as well as the act 1494, c. 54, the object of which appears to have been to enforce in the courts the study of the Roman laws; and we shall not perhaps greatly err in conceiving his zeal to have been employed in the erection of the Court of Daily Council in 1503. It was moreover at his solicitation that the convent of Grey Friars at Stirling and the Chapel Royal were founded in 1494, the same year in which he also obtained a papal bull for the erection of a university at Aberdeen, in place of the narrow seminary previously existing there. To Bishop Elphinstone Aberdeen also owes another great work, namely the bridge across the river Dee: to the completion of his plans the prelate left 10,000 pounds Scots in money lying in his coffers at his death.

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* [illegible] 1831, p. 224.

ELSHEIMER, or **ELZHEIMER, ADAM**, was born at Frankfort in 1574, and, according to the most probable account, died in 1620; but the statements of writers on the subject differ extremely. Finding that he was not likely to acquire in his own country that knowledge of the art which he saw to be necessary, he resolved to go to Rome, where he soon formed an intimacy with Pinas, Lastman, Thomas of Landau, and other eminent painters. Having carefully examined the curiosities of Rome and the works of the greatest artists, both antient and modern, he resolved to adopt a style of painting peculiar to himself; this was the designing of landscapes with historical figures on a small scale, which he finished in so exquisite a manner that he was not only far superior to all his contemporaries, but is probably unrivalled in his own line by any artist of subsequent times. He designed entirely after nature; and a most retentive memory enabled him to recollect everything that had struck him, and to make the most judicious use of it in his compositions. It is scarcely possible to speak in too high terms of the rare union of excellences in the works of Elsheimer; he is equally admirable for the fine taste of his design, the correct drawing of his figures, the lightness, spirit, and delicacy of his touch, the beauty of his colouring, the high finishing of his works, so that the minutest parts will bear the closest inspection, and, above all, his admirable management and distribution of light and shade, and perfect knowledge of the principles of chiaroscuro, which was manifested in his pieces representing scenes by torch or candlelight, moonlight, sunrise, or sunset. Even during his lifetime his pictures bore a very high price, which was considerably increased after his death. It is lamentable to add, that he was unable to acquire affluence or even comfort by the exercise of his talents. He had a large family; and though he received very high prices for his works, he spent so much time and labour upon them, that he could not subsist by what he earned. He was at length cast into prison for debt; and though very soon released, the disgrace even of that short confinement preyed on his spirits, and he sunk under his misfortunes. The Italians, who highly honoured and esteemed him, deeply regretted his untimely death; and his friend Thomas of Landau was so grieved at his loss that he could no longer bear Rome, but retired to his own country.

Old Teniers and Bamboccio were indebted for great part of their excellence to their study of the works of Elsheimer.

ELSINORE (in Danish, *Helsingoer*), a considerable seaport and town in the bailiwic of Frederiksborg, in the Danish island of Seeland, and at the narrowest point of the strait between the Kattegat and the Baltic. It is opposite to Helsingborg, a Swedish seaport, and lies in 56° 2′ N. lat. and 12° 37′ E. long. It is the spot where the Danish government collect certain dues on every vessel passing through the Sound. On a tongue of land east of it is the castle and fortress of Kronborg, and there is a handsome palace, called Marienlyst, with an hospital for seamen, built upon a commanding eminence close to it. Elsinore itself is an open town, and has been much improved of late years. It consists of a main street of considerable length, with several lateral streets; has a harbour accessible to ships of small draught, and contains 2 churches, about 650 houses, a town-hall and high-school, an infirmary and hospital, a theatre, a quarantine establishment, and about 7000 inhabitants. Independently of a good foreign trade, the townsmen are employed in making straw hats, arms, refined sugar, brandy, &c., printing cottons, and carrying on fisheries. The harbour is formed by what is here called a bridge, or wooden pier. Elsinore is about twenty miles north of Copenhagen. It was the birthplace of Saxo Grammaticus, a celebrated writer of the twelfth century. The number of vessels which have paid the Sound-dues was in 1777, 9053; 1783, 11,233; 1787, 9758; 1792, 12,114; 1799, 7844; [illegible] 12,181; 1817, 13,148; 1823, 9203; 1830, 13,212; and [illegible] 10,986, of which last 3195 were British. The average for the three years, 1831 to 1833, was 12,045; and of British, [illegible]

ELSTER. [Elbe.]

ELSTOB, WILLIAM, descended from an antient family in the bishopric of Durham, was born at Newcastle-upon-Tyne, January 1, 1673. His father was Mr. Ralph Elstob, a merchant of that place. He received his earliest education in his native town, but was afterwards sent to Eton, and thence to Catherine Hall, Cambridge. Being of a consumptive habit, and the air of the place not agreeing with him, he removed to Queen's College, Oxford, whence, in 1696, he was chosen fellow of University College. In 1701 he translated the Saxon Homily of Lupus into Latin, with notes, for Dr. Hickes; and about the same time he translated Sir John Cheke's Latin version of Plutarch's Treatise on Superstition, which was printed at the end of Strype's Life of Cheke. In 1702 he was presented by the dean and chapter of Canterbury to the rectory of the united parishes of St. Swithin and St. Mary Bothaw, in London; where he continued till his death. In 1703 he published at Oxford, an edition of Roger Ascham's Letters; and in 1709, in the Saxon language, with a Latin translation, the Homily on St. Gregory's day. He intended the publication of several other works in Saxon literature, more particularly the Saxon laws, and Alfred's paraphrastic version of Orosius. He died March 3rd, 1714-15. He published one or two other works, but of less consequence than his Saxon labours. (Pegge's *Hist. Account of the Textus Roffensis*; and of Mr. Elstob and his sister, in the *Bibl. Topogr. Britan.*, No. XXV.; Kippis's *Biogr. Brit.*)

ELSTOB, ELIZABETH, sister of the above, was born at Newcastle, September 29th, 1683. During her brother's continuance at Oxford, she resided chiefly in that city with him, and afterwards removed with him to London, where she joined him in his Saxon studies. The first public proof she gave of this was in 1709, when, upon his printing the Homily upon St. Gregory's day, she accompanied it by an English translation and a Preface. Her next publication was a translation of Madame Scudery's Essay on Glory. By the encouragement of Dr. Hickes, she undertook a Saxon Homiliarium, with an English translation, notes, and various readings, of which a few sheets only were printed at Oxford, in folio, when the work was abandoned. Her transcript of the Saxon Homilies, in preparation for this work is preserved in the Lansdowne Collection of MSS. in the British Museum. In 1715 she published a Saxon grammar, in 4to., the types for which were cut at the expense of Lord Chief Justice Parker, afterwards earl of Macclesfield. After her brother's death, Mrs. Elstob retired to Evesham in Worcestershire, where she subsisted with difficulty by keeping a small school. Each scholar paid her 4*d.* a week. She was subsequently patronised by Queen Caroline, who granted her a pension of [illegible] a year; but this bounty died with the queen. In 1739 the duchess dowager of Portland took Mrs. Elstob into her family as governess to her children, where she continued till her death, May 30th, 1756. She was buried at St. Margaret's, Westminster. (Pegge's *Account of the Textus Roffensis*, ut supr.; Tindal's *Hist. of Evesham*; Nichols's *Lit. Anecd.*)

ELTHAM. [Kent.]

ELUTRIATION, the process of separating substances reduced to powder, when of different specific gravities, by means of water. It is also employed as a method of reducing any one substance to a fine powder; thus the creta præparata, or prepared chalk, of the London Pharmacopœia, is prepared by mixing finely-powdered chalk with water, stirring the mixture, and while it is yet turbid allowing the upper portion of the water to run off; and when this is allowed to settle, the chalk or any other substance similarly treated settles in a very fine powder. By the process of elutriation ores, especially those of tin, are separated from earthy matter.

ELVAS, a strongly-fortified town in the province of Alentejo in Portugal, about 125 miles east of Lisbon, situated on a hill in the midst of a plain, which extends to the east as far as the Guadiana. It is a frontier town, being about 12 miles west of Badajoz, the first Spanish town on that side, and on the high road from Lisbon to Madrid. Elvas is the strongest fortress of Portugal: the town is situated between two castles, Fort Santa Lucia and Fort la Lippe, which stand on two summits commanding the town. Elvas is a bishop's see, and the head town of a comarca, or district, of the same name. The town contains about 13,000 inhabitants, and has a fine cathedral, six parish churches, several convents and hospitals, and very extensive barracks, which are bomb-proof. A handsome aqueduct brings water to the town from a distance of about 4 miles, and supplies the various fountains. The country around is productive in corn, wine, and oil. (Miñano, *Diccionario Geografico; Views of Elvas*, by H. Smith, London, 1813.)

ELWUND. [ECBATANA.]

ELY, a city in the Isle of Ely in the northern part of the county of Cambridge, 16 miles N.N.E. from Cambridge and 67 N. by E. from London.

According to Bede, the word Ely, which was given to a large district of fens in which the city is situated as well as to the city itself, is derived from Elge or Elig an 'eel,' and consequently has reference to the abundance of eels in the neighbourhood. But most antiquarians derive the appellation from Helig, a British name for the willow, which grows in great quantities in the isle. Etheldreda, daughter of Anna king of East Anglia, and wife of Oswy king of Northumberland, preferring cloistered seclusion to courtly splendour, retired here about the year 670, and soon after founded a monastery, which was dedicated to the Virgin Mary, and of which she became the abbess. In 870 the whole abbey was pillaged and destroyed by the Danes, and all its revenues were annexed to the crown, which retained them till the reign of Edgar. In 970 that king granted the isle with all its appurtenances, privileges, &c., to Ethelwold, bishop of Winchester, who rebuilt the monastery, and provided it with monks. The charter of Edgar was confirmed by Canute and Edward the Confessor, and subsequently by the Pope. The isle was gallantly defended against William the Conqueror, but after repeated attacks the inhabitants were obliged to surrender, many of them were put to the sword, and most of the valuable furniture and jewels of the monastery were seized, but through the firmness of Theodwin, who had been made abbot, the property was restored. In 1107 Ely was erected into a bishopric by Henry I., and Hervey, bishop of Bangor, was appointed to the see. The lands of the monastery were divided between the bishopric and the monks, and the monastery was governed by the prior, who was called the Lord Prior. After the surrender of the monastery to Henry VIII., he granted a charter to convert the conventual church into a cathedral by the title of the Cathedral Church of the Undivided Trinity. The cathedral of Ely is the workmanship of many different periods, and displays a singular mixture of various styles of architecture, but taken as a whole it is a noble structure. The most antient part is the transept, which was erected in the reigns of William Rufus and Henry I. The nave and great western tower were built in 1174, and the other parts of the edifice, which consists of a nave, transept, an octagon tower, choir, antichoir, Trinity chapel, Galilee porch, &c., were erected at different periods between that time and the year 1534.

The interior is exceedingly beautiful; the nave is supported by lofty columns, almost without ornament, which perhaps adds to the imposing effect. The octagon tower combines solidity with gracefulness probably more than any other building of the kind in Great Britain; and the choir is a perfect specimen of the early English style of pointed architecture. The stalls are beautiful specimens of wood carving. The whole length of the edifice, including the Galilee porch, is 517 feet; and the western tower, which is of exquisite workmanship, is 270 feet high.

There are many interesting monuments, among which are the tomb and effigies of Bishop Alcock, and that of Tiptoft, earl of Worcester. The bishops of Ely, like those of Durham, formerly possessed, by grant of Henry I., Jura regalia,[*] and appointed their own chief justice, chief bailiff, &c., but their secular jurisdiction is taken away by the 6th and 7th Will. IV., c. 87, and vested in the king, who is empowered to appoint a Custos Rotulorum for the isle. The gaol is also abolished, and committals are made to the county gaol at Cambridge. The quarter sessions are still held by the justices of the peace of the isle, but the assizes are now held by her majesty's judges who join the Norfolk circuit.

The bishop has considerable patronage at Cambridge; he is visitor of four colleges, appoints absolutely to the mastership and one fellowship of Jesus College, chooses one out of two nominated by the society to be master of St. Peter's college, and has besides nearly 100 livings in his gift.

The city is situated on a considerable eminence near the river Ouse, which is navigable for barges from Lynn to Ely. It consists principally of one long street partially paved; in the centre of the town is a spacious market-place. The soil in the vicinity is exceedingly fertile, and supplies great quantities of fruit, vegetables, and butter to the London market. There is a considerable manufactory for earthenware and tobacco-pipes, and there are several mills in the isle for the preparation of oil from flax, hemp, and cole-seed. The market is on Thursday for corn and cattle. The fairs are on Ascension-day and the eight following days and October 29th for horses, cattle, hops, and Cottenham cheese. The population of the city is 6189, of whom 3152 are females. there were in 1831 1246 inhabited houses, and 718 families employed in trade and agriculture. The isle of Ely contains a population of 47,152.

The city, exclusively of the liberty of the college, which is extra-parochial, comprises the parishes of St. Mary and the Holy Trinity, in the peculiar jurisdiction and patronage of the dean and chapter. The living of St. Mary's is a perpetual curacy of the clear yearly value of 94*l.* The church is a handsome building, partly in the Norman and partly in the early English style of architecture. The Church of the Holy Trinity is attached to the cathedral, and is what formerly was the Lady Chapel. It was commenced in the reign of Edward II., and is one of the most perfect buildings of that age. It is 200 feet in length, 46 in breadth, and 60 in height; it has neither pillars nor side-aisles, but is supported by strong spiring buttresses, surmounted with pinnacles. The living is of the yearly value of 116*l.* There are places of worship for Baptists, Independents, and Wesleyan Methodists. The grammar-school, founded by Henry VIII. in 1541 is under the control of the dean and chapter, who appoint the master. There is also a national school for boys and girls supported by voluntary contributions. A charity school was founded in 1730 by Mrs. Catherine Needham, who endowed it with lands worth nearly 400*l.* per annum for the instruction and clothing of thirty boys, with each of whom an apprentice fee of 20*l.* is given, issuing out of lands bequeathed by Bishop Lancy for that purpose. James Bentham, whose history of Ely is not only interesting as a local history, but valuable for the observations which it contains on the Saxon, Norman, and Gothic styles of architecture, was educated at the grammar-school of this city. [BENTHAM.]

ELYMA'IS, the name of a district of Persia between Susis and Media, and of a city, its capital, situated on the river Eulæus. The name seems to be the same with Elam, which is used in the sacred writings as a general designation for Persia. According to Strabo (p. 744), the population consisted of husbandmen, who cultivated the plains, and a numerous army, principally archers, who occupied the high lands. The king of Elymais was so powerful in the time of Strabo that he could assert his independence in spite of the Parthians, though it appears from the same writer that the Parthians on one occasion invaded Elymais, and carried off a spoil of 10,000 talents from the Elymæan temple of Artemis at Azara. Antiochus Epiphanes had previously made an unsuccessful attempt to rob the same wealthy temple. (Joseph. *Antiq.* xii. c. 13; Justin. lib. xxxii., and *Maccabees* i. vi. 1.) Strabo attributes this attempt to Antiochus the Great, but he is perhaps in error. The author of the second book of the *Maccabees* (ix. 2) calls the chief city of this district Persepolis, probably from having by mistake confused Elymais with Elam, for Persepolis stood upon the Araxes. (Strabo p. 729.)

ELYOT, SIR THOMAS, one of the best writers of the time of Henry VIII., was the son of Sir Richard Elyot of the county of Suffolk. He received his university education at St. Mary's Hall in Oxford. He afterwards travelled through Europe, and upon his return was introduced at the court of Henry VIII., who conferred upon him the honour of knighthood, and subsequently employed him in several embassies, particularly to Rome in 1532 in the affair of the as an example of the advantage which may be taken of particular circumstances by which a great expense may sometimes be saved. In other situations where the shingle is not thrown up, and the wall is not so immediately exposed to the action of the waves, an excellent facing of the wall is made by several rows of piles from five to fifteen feet long, driven along the side of the earthen bank in the form of steps rising above each other. These piles are driven very close together, and the distance between the rows is about two feet. This interval is filled with stones, and bushes are pinned down over them by means of wooden pins driven horizontally through holes made in the piles. This contrivance effectually prevents the washing away of the bank.

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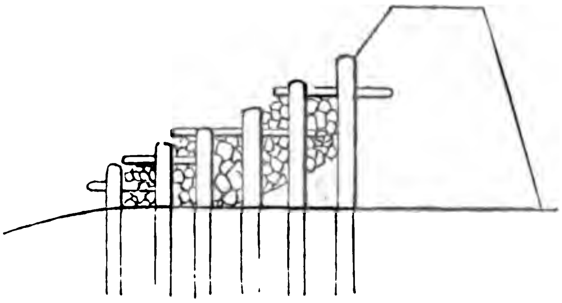
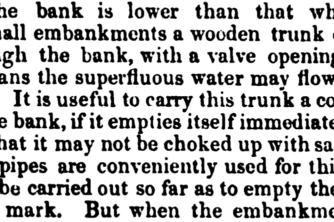
[*] There is an account of the constitution of the court of Ely in Grant v. Bagge, 3 East's Reports, 128.



Where the land lies very flat for a considerable distance from the shore, it is of advantage to have two complete banks, one within the other; so that if the outer bank is broken through, the second will keep back the waters, until the first can be repaired. The ground between the two lines of banks is usually left in pasture. In this case the damage done by an inundation of salt-water will not be so great as if the land were arable; and unless it remain flooded for a considerable time, the herbage suffers little, if anything, from it.

The water which accumulates within the banks and is collected in the internal ditch and those which divide the marshes must be let off occasionally by means of channels and sluices at the time when the tide is out, and the water outside the bank is lower than that which is within it. In small embankments a wooden trunk or pipe may be laid through the bank, with a valve opening outwards, by which means the superfluous water may flow out, and none flow back. It is useful to carry this trunk a considerable way outside the bank, if it empties itself immediately into the sea, in order that it may not be choked up with sand or shingles. Cast-iron pipes are conveniently used for this purpose, and they may be carried out so far as to empty themselves below low-water mark. But when the embankment is very extensive, and there are streams flowing through the part which is embanked, larger flood-gates and more extensive works are necessary. These being opened and shut as occasion may require, serve to keep the channel clear, by producing occasionally a considerable rush of water to carry away mud and sand which would otherwise have accumulated at the mouth of it. When the level of the land which is embanked is below the usual level of the waters which are without, the water is raised by means of engines over the banks, as is the case in the fens. [Draining.]

In the forming of the banks, where the soil may not be quite impervious to water, it is useful to begin by digging a ditch in the line of the intended bank, of such a depth as to reach an impervious subsoil. This ditch is to be filled up with clay or tempered earth, and as the bank is raised, the middle of the bank should be composed of the same materials, which will thus form a vertical wall A B up to the top; and the more porous earth being heaped up against the sides of this wall will form the slopes of the bank: thus the whole will be perfectly impenetrable to the water. The clay should be well trod in with the feet in a moist state, and no pieces of wood, or even straw should be in it; for a straw may be the cause of the water finding a passage through a bank, and this passage gradually widening will soon produce a hole, which may in the end cause the destruction of the bank. Moles and worms are great enemies to dykes. In Holland the storks are held in great veneration, and are never molested, because they are supposed to destroy a worm which often does great mischief to the dykes by perforating them.



EMBARGO, the word used to denote the act by which the public authorities of a country lay an arrest on ships to prevent their leaving its ports. On the breaking out of war with any nation it has been usual for the government of each country to lay an embargo upon such of the enemy's ships as are within reach, with a view to their being declared good and lawful prize. During the progress of war when any expedition is on foot against the enemy, and it is desirable to keep the circumstance from the knowledge of the party to be attacked, it is usual to lay an embargo upon all private vessels, as well those under the national flag as foreign vessels, until the object to be attained by secrecy is accomplished. An embargo may also be laid by the government upon ships belonging to its subjects with a view to their employment for the service and defence of the nation. In all these cases it is clear that embargoes are detrimental to commerce; the only case in which they have an opposite character is when a foreign vessel of war or privateer frequents a neutral port, and is restrained from quitting the same until a certain time shall have elapsed after the departure from the port of any vessel of which it might otherwise make prize.

EMBER-DAYS and **WEEKS**, certain seasons of the year set apart for imploring the blessing of the Almighty on the produce of the earth by prayer and fasting, observed in the Christian church as early as the third century. Pope Calixtus, who first directed them to be observed, also ordained that the same seasons should be especially devoted to the preparation of the clergy before their ordination. These seasons are mentioned in the laws both of Alfred and Canute. At first the Ember-days were not uniformly observed by different churches at the same time; but the Council of Placentia, A.D. 1095, fixed the spring and summer Ember-days to be the Wednesdays, Fridays, and Saturdays after the first Sunday in Lent and Whitsunday; those of autumn and winter upon the same days after the feast of the holy cross (September 14th) and St. Lucia (December 13th). The Sundays immediately following all these seasons are still appointed by the thirty-first canon of the Church of England for the ordination of ministers. The four weeks in which the Ember-days severally occur are called Ember-weeks. Shakspeare speaks of Ember-eves. The etymology of Ember-days is uncertain. Some have derived the term from *ember*, ashes; others from ἡμέρα, days; and others from *ymbren*, which in the Anglo Saxon means a circle or revolution, the Ember-days being seasons in the course or circuit of the year. (Broughton's *Dict. of all Religions*, p. 357; Brady's *Clavis Calendaria*, 8vo. Lond. 1812, vol. i. p. 223-226.)

EMBERI'ZIDÆ. (Zoology.) The Latin name for the birds, popularly known in England by the name of Buntings. [Fringillidæ.]

EMBEZZLEMENT, from the old French word besler, or *embesler*, to filch, is the fraudulent appropriation by servants and others of money or goods entrusted to their care or received by them on account of their employers.

By Clerks and Servants. Is an indictable offence under the 7th and 8th Geo. IV., cap. 29, sect. 46, and by that statute is declared to be larceny, and punishable with transportation for a term not exceeding fourteen or less than seven years, or by imprisonment for any term not exceeding three years. If the offender be a male he is liable to be once, twice, or thrice publicly or privately whipped (if the court shall so think fit) in addition to such imprisonment. This statute extends to the clerks and servants (both male and female) of all persons, whether in or out of trade, provided they are entrusted to receive moneys for their employers.

By Agents, Bankers, Attorneys, &c. Of moneys and securities, when entrusted to them for any special purpose, is constituted a misdemeanour by the same statute, cap. 29, and subjects the offender to transportation, as in the case of clerks and servants, or to fine and imprisonment, at the discretion of the court.

By Public Servants. Under the 2nd Wm. IV., cap.

sect. 1, persons employed in the public service and embezzling any moneys or securities entrusted to them are to be deemed guilty of felony, and are punishable in the same manner as clerks and servants for the like offence, except being whipped.

As to bankrupts and insolvents, see Bankrupt and Insolvent.

EMBLEM; in Greek, ἔμβλημα (from ἐν and βάλλειν, to cast in), a thing inserted, inlaid work, Mosaic, or the like. In English, an emblem is a figurative representation; a representation which by virtue of association suggests to our minds something not expressed to our senses. For instance, a lion is the emblem of courage, a cock of watchfulness, because watchfulness and courage are qualities commonly associated in our minds with those animals, as their characteristics. So by historical association, without any intrinsic fitness, one thing may become the emblem of another; as the wheel and other instruments of torture are emblems of saints who have perished by them. Any device, however arbitrary, when established by usage as a distinctive mark, may become the emblem and be put for that which assumed it, either in writing or in imitative art; as for instance in Wordsworth's lines:—

From town to town, from tower to tower,
The red rose is a gladsome flower, &c.

The red rose is the emblem of, and is universally understood to mean, the house of Lancaster, though no mention of that house has been made.

EMBLEMENTS, from the French words *emblements de bled* (corn sprung or put above ground), in its *strict* signification means the profits of land sown, but in its usual sense it extends to roots planted and other annual artificial profits which arise from the soil, as for example, standing corn, hemp, saffron, flax, hops, and garden produce growing above ground, as melons and cucumbers, all of which annually require either sowing, planting, or manuring at the expense of the tenant, and are not a permanent or natural product of the soil.

By a rule of law founded on public policy, and for the encouragement of husbandry, all persons are entitled to the emblements of land sown by themselves in which they have an uncertain interest, and which is determined either by the act of God, or of the law, between the time of sowing or planting and the severance of the crop.

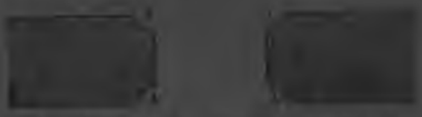
Thus the representatives of a tenant for life, who dies previous to harvest, are entitled to the growing crops as a compensation for the labour and tillage bestowed on the lands by the deceased. The same rule also exists with regard to a strict tenant at will, if his tenancy is determined by the landlord previously to the corn being reaped, and for this reason, that as the tenant could not know when the landlord would determine his will, he could not therefore make any provision against it, and having sown the land upon a reasonable presumption of taking the produce, the law will not suffer him to be a loser by it. If, on the other hand, a tenant for life or at will puts an end to his occupancy by his own act he will not be entitled to the crops, as no uncertainty can exist on his part, which is the point upon which all cases of emblements rest.

The parochial clergy and their under-tenants, being also tenants for lives, and their representatives, are in like manner entitled to all the advantages of emblements by the 28th Henry VIII., c. 11, sect. 6; and under that statute they are enabled to bequeath by will grain growing upon the glebe land, manured and sown at their own cost; but for the reason above mentioned, a person who resigns his living is not entitled to the emblements.

Fruit trees which cannot be presumed to be planted in contemplation of present profit, but rather of being permanently useful to a succession of tenants, and grass which grows of itself without annual expense and labour on the part of the tenant are not included within the meaning of emblements. (Gwillim's [illegible]; Woodfall's *Landlord and Tenant*.)

EMBRACERY, an attempt to influence or corrupt a jury, or induce them to favour one of the parties in a cause. It is punished by fine and imprisonment. [Attaint.] The offence of embracery is complete whether the jury on whom the attempt is made give any verdict or not, or whether the verdict given be true or false.

EMBRASURE, in Architecture, is the indent of a battlement. [Battlement.] It signifies also the splay of a door or window. In walls of some thickness the apertures are splayed on the inside or outside, or both, in order to admit more light, thus making the angles of the wall obtuse instead of rectangular: thus—



AA are splays forming the embrasure. The term is derived from the French.

EMBRASURE (in fortification) is an opening made in an epaulement or parapet for the purpose of allowing a gun to be fired through it. Embrasures are usually two feet wide at the neck, or interior extremity; and, at the mouth or exterior extremity, their width is equal to half the thickness of the epaulement, that is about nine feet. The cheeks or sides are frequently formed vertically at the neck, that the men who serve the guns may be covered as much as possible; but, beyond that part, each side declines gradually from a vertical plane outwards, in order that it may be less injured by the fire of the place; and, at the mouth, this deviation amounts to one foot. The sole or lower surface of the embrasure is five feet below the top of the epaulement, or two feet six inches above the platform on which the gun-carriage is placed; and it is either parallel or inclined to the horizon, according to the position of the fixed object against which the fire is to be directed.

In general the axis of the embrasure is perpendicular to the length of the epaulement, but when the confined nature of the ground does not permit the epaulement to have the required direction, the embrasure is necessarily cut obliquely, in which case the breadths above given are still set out perpendicularly to the axis.

In permanent fortifications the sides of the embrasures are generally reveted or lined with brickwork; but in field batteries the earth at the sides is either without support, or is kept up, about the neck, only by gabions or fascines.

EMBROCATION (from Embrocho, ἐμβρέχω, a moistening), a term employed to denote certain external applications, which had for their object to soften and dissipate swellings: in this sense they do not differ from fomentations; but the word has been extended beyond its original meaning, and signifies oleaginous or spirituous compounds, which may excite the vessels of the skin to increased action, and produce all the effects of counter-irritants, or by their influence on the extremities of the nerves may assist in resolving spasm, and so act as Antispasmodics.

EMBRUN, a frontier fortress of France in the department of Hautes Alpes, on the north-west bank of the Durance, about 333 miles in a straight line south-south-east of Paris.

Embrun was known to the Romans by the name of Ebrodunum, Eburodunum, Hebridunum, or Eburunum. It obtained various privileges from the Roman emperors; and in the division which was made of Gaul in the later period of the Roman domination was included in the province of Alpes Maritimæ (the Maritime Alps), of which it was one of the chief towns. It became early the seat of a bishopric; afterwards of an archbishopric. The see continued to exist up to the period of the French revolution.

The archbishop of Aix still takes the additional title of archbishop of Embrun, but the diocese has not been restored. Embrun was in the middle ages the capital of the district of Embrunois, in Dauphiné. The town suffered in the religious wars of the sixteenth century, and was taken in 1692 by the duke of Savoy.

Embrun is fortified and tolerably well built. Among the most remarkable buildings are the former cathedral, the foundation of which is ascribed to Charlemagne, and the archiepiscopal palace. There is a central house of correction, the buildings of which were formerly occupied as a seminary for the priesthood. The population in 1832 was 2392 for the town, or 3092 for the whole commune. The chief trade carried on is in sheep: there are several tan-yards, and some hat manufactories. Excellent slates are quarried near Embrun, and there are orchards and vineyards near it. The site is at a considerable elevation above the level of the sea.

Embrun is the capital of an arrondissement, which had in 1832 a population of 30,625.

EMBRYO. [Fœtus.]

EMDEN, or **EMBDEN**, the chief town of a bailiwic, in the north-western part of the province of Aurich, formerly East Friesland, in the kingdom of Hanover. It lies in 53° 22′ N. lat. and 7° 12′ E. long., a little below the efflux of the Ems into the Dollart, a bay of the German Ocean, and is connected with that river by a canal about two miles long, called the Delf Canal, which was constructed at the expense of the town in 1769. Emden is surrounded with walls and towers, and consists of Faldern, the old town, and two suburbs, which contain about 2250 houses and 12,500 inhabitants, of whom about 450 are Jews. It has all the appearance of a Dutch town, and is intersected by canals, over which there are thirty bridges. Its spacious townhall, with an old armoury and library, is one of the finest buildings in East Friesland. There are six churches, of which three belong to the Dutch form of worship, one to the French Protestant, one to the Lutheran, and one to the Roman Catholic; there are also a synagogue and Mennonite chapel, a gymnasium, schools of navigation and design, elementary schools, a richly-endowed orphan asylum, a castle and custom-house, and societies of the fine arts and national antiquities.

Emden owes its prosperity to a colony of Dutchmen, who sought refuge in it, and communicated so great an impulse to its commercial enterprize that in the year 1652 the population amounted to 20,000, and owned upwards of 600 vessels. A century afterwards viz., in 1749, the town had so much declined that the population did not exceed 8000. It came into the hands of Holland in 1808, was made the chief town of the French department of Ostem in 1810, and on the 15th of December, 1815, was, with the whole of East Friesland, incorporated with the kingdom of Hanover. It would rival Hamburg and Bremen in trade but for the shallowness of its harbour. It has been a free port ever since the year 1751; but the Delf canal, which unites the harbour with the town, and is drained and cleansed by means of five inland canals, has frequently no water in it, and can be entered at high water only; and even then it is not navigable by vessels which draw more than 13 or 14 feet of water. All ships of greater draught are obliged to discharge their cargoes in the fine roadstead called Delf, into which the canal opens. There is a treckshuyt, or towing canal, about 14 miles in length, between Emden and Aurich.

Emden is the chief commercial place in Hanover; and ship-building is carried on to a considerable extent. As early as the year 1682 it had an African trading company, and in the middle of the last century an East India company. The herring fishery off Scotland, which is a source of great profit to the place, is carried on by four companies, who send out between fifty and sixty ships. This branch of its fishery alone employs above 1500 individuals, and produces annually from 12,000 to 13,000 tons of fish. Emden has brandy distilleries and sawing and oil-crushing mills, besides manufactures of fustian, cottons, stockings, sail-cloth, cordage, needles, leather, soap, tobacco, &c. It has considerable trade in linens, thread, grain, butter, and cheese (Embder kaese), the last of which is in much repute. Between 900 and 1000 vessels enter the port every year. The dykes and sluices, which protect the neighbouring country from inundation, are a cause of great expense to the municipality; it is estimated that they gain about two miles square of soil every forty years by pushing out the embankments into the Dollart. Emden is the birthplace of Backhuysen, the celebrated marine painter. Opposite the harbour, in the Dollart, are the small remains of the Island of Nessa, or Nesserland. It is separated from Delf by a swampy arm of the Ems, and previously to the inundations which overwhelmed it between the years 1277 and 1287, formed a beautiful spot of about 80 square miles, with a town called Torum, 2 market-towns, numerous villages, and several monasteries and convents. All that is left of it at the present day is a church and five or six houses, built on high mounds of earth, but protected by dams so slight that they are in imminent danger from the sea.

The bailiwic of Emden has an area of about 78 square miles, and contains 1 town, 1 market-village, Oldersum, on the Ems, with about 820 inhabitants, 4 villages, and 30 parishes. The population amounts to about 11,500.

EMERALD. [BERYL.]

EME'RITA. (Zoology.) [HIPPA.]

EMERSION (Astronomy), the reappearance of one heavenly body from behind another after an eclipse or occultation.

EMERSON, WILLIAM, an eminent mathematician, philosopher, and mechanist, was born at Hurworth, a village about three miles from Darlington, in June 170[illegible]; he died May 20th, 1782, at his native place, aged nearly eighty-one years.

His father, Dudley Emerson, was a schoolmaster, and is said to have been a tolerable proficient in the mathematics of that time: this circumstance furnished his son with ample means of cultivating his taste for the same science, both by means of a good mathematical library which his father possessed, and the good mathematical tuition which he received in his earlier years. A young clergyman, the curate of Hurworth, also lodged in his father's house, and from him he received all requisite assistance in the study of the Greek and Roman classics, in which he became well versed.

After the death of his father, Emerson attempted to continue the school, which however he soon relinquished; but whether it arose from the impetuosity of his temper, which rendered him unfit for such an occupation, or that a small competence left him by his father (he being his only child) rendered it a matter of indifference to him to increase his income, cannot be ascertained. He devoted his long life to writing a series of mathematical works, which, except those of Simpson, were, till a comparatively recent time, the very best in our language. He also contributed largely to the different mathematical periodicals of his time, though almost always under some fanciful name, as Merones, Philofluentimecanalgegeomastrolongo, &c.

Mr. Emerson was in person rather short, but strong and well-formed, with an open honest countenance and ruddy complexion. A portrait of him, by Sykes, was painted and engraved in the latter part of his life; but *it is not often* to be met with, as only a few copies of it were circulated. His health was generally excellent till near the latter part of his life, when he became a great sufferer from the stone.

Emerson was in many respects a very eccentric person; fancifully coarse in his dress, and uncourteous in his conversation. He was, nevertheless, when in his happier moods, a delightful companion, and his discourse full of instruction, deep thought, and startling originality of opinion.

All his books were published in London; and it was his invariable practice to walk to town and shut himself up in some obscure lodging to devote himself sedulously to the correction of the successive sheets of his works with a care never exceeded even by Hamilton or Cruden: and certainly, of all the mathematical works that have ever been published, those of Emerson are the freest from errata.

Emerson was married, but had no children. He amused himself with fishing, a diversion to which he was much attached, and would frequently stand up to his middle in the water for hours together when he found it gave him a better position for the use of his fly or his angle. He was an excellent practical mechanic, and of most of the machines described in his work on mechanics he had made very good models. The spinning-wheel delineated in that work was the one on which his wife employed her leisure hours. He had also a very profound knowledge of the musical scales, both antient and modern, although he was but a poor performer: still he was dextrous in the repair of musical instruments, and was generally employed to tune harpsichords and clean the clocks throughout the district in which he resided.

The bold and frank manner in which Emerson spoke on all subjects has led some persons to affirm that he was a sceptic in religion. Of this however there is not the slightest evidence; but it appears to have arisen from the insinuations of his scientific opponents, who thus attempted to crush his reputation with the world, and thereby weaken his authority in matters connected with science—a course too often adopted in our own day by those who contend for victory rather than truth. Emerson was through a long life universally accounted a man of integrity; but his honesty often led to dogmatism, and his indignation at error to an expression of feeling that gave to his controversial writings an air of ungracious severity.

A considerable number of Emerson's processes are marked with peculiar elegance and considerable power of invention; still there is apparent in all of them a want of that power of generalisation which distinguishes the highest order of minds. His Method of Increments is the most original of his works; and his Doctrine of Fluxions is perhaps the most elegant. His Mechanics is the work [illegible] which he is most generally known, a circumstance probably owing to its containing descriptions of so many of the more usual and useful machines; but it is a work singularly crude and ill-digested, and not less singularly incomplete in even the enumeration of the most important principles of mechanical science.

The following is a list of his works, all in 8vo., except his Mechanics and Increments in 4to., and his Navigation in 12mo.

1. Doctrine of Fluxions. 2. Projection of the Sphere, Orthographic, Stereographic, and Gnomonic. 3. The Elements of Trigonometry. 4. Principles of Mechanics. 5. A Treatise on Navigation. 6. A Treatise on Arithmetic. 7. A Treatise on Geometry. 8. A Treatise on Algebra. 9. The Method of Increments. 10. Arithmetic of Infinites, and the Conic Sections, with other curve lines. 11. Elements of Optics and Perspective. 12. Astronomy. 13. Mechanics, with Centripetal and Centrifugal Forces. 14. Mathematical Principles of Geography, Navigation, and Dialling. 15. Commentary on the Principia, with a Defence of Newton. 16. Miscellanies.

EMERY. [Corundum.]

E'MESA. [Syria.]

E'METIA, a vegetable alkali obtained from ipecacuanha root, in which the powers of that medicine reside. In order to prepare it, the root is reduced to powder, and then treated with sulphuric ether to separate a fatty substance, and afterwards with boiling alcohol. The alcoholic solutions, when evaporated, leave a bitter brown extract, which contains emetia combined with gallic acid. This is to be redissolved in water, and boiled with an excess of magnesia, which decomposes the gallate of emetia; the magnesian precipitate is to be washed with a little cold water, and then boiled in alcohol. The emetia dissolved in the alcohol is separated by evaporation; but as it is coloured, it is recombined with an acid, and after being decoloured by animal charcoal, it is to be again precipitated by magnesia.

Emetia, when pure, is white, pulverulent, and uncrystallizable; its taste is rather bitter, and it melts at 104° Fahrenheit, and afterwards decomposes at a temperature below 212°. It suffers no change by exposure to the air; it is slightly soluble in cold water, but readily dissolved by alcohol: the solution restores the blue colour of litmus paper which has been reddened; it is precipitated by tincture of galls; acids are but imperfectly saturated by it, and it yields with them uncrystallizable salts, which have been but little examined.

In the dose of half a grain it is stated to act as a powerful emetic, and in larger doses its effects are extremely violent.

It is composed of—

Hydrogen	7·77
Carbon	64·57
Oxygen	22·95
Azote	4·30
	99·59

EMETICS (*ἐμετικά, emetica*) are substances which influence the stomach in a peculiar manner, so as to invert its action and cause vomiting; and this effect is produced without reference to the quantity of matter introduced into that organ or into the circulation. This definition is intended to exclude, on the one hand, the mere inversion of the stomach by the introduction of food or drink, either in inordinate quantity, or of too stimulating a quality; and, on the other, to comprise those means of exciting vomiting by their direct introduction into the circulation by injection into a vein. The action of emetics must be viewed in two stages, the primary and secondary. The primary effects of emetics are limited to the emptying of the stomach, compressing, during the act of vomiting, the gall-bladder and pancreas, and exciting to contraction the muscular parietes of the abdomen and thorax, as the machinery by which the process of vomiting is chiefly accomplished. We shall here briefly trace the obvious phenomena of this process, without attempting to account for their occurrence.

Soon after a quantity of an emetic substance or solution (such as ipecacuanha or emetic tartar) has been received into the stomach, a feeling of anxiety is experienced in the epigastrium, a general uneasiness termed nausea is felt, which progressively becomes greater, till it ends in the forcible expulsion of the contents of the stomach. This gives a concussion to the whole frame, every part of which experiences more or less of a vibratory motion. The condition of the system is considerably different prior to and during the act of vomiting. In the preliminary stage the countenance is pale and collapsed; the pulse is small, contracted, irregular, but quick more generally than slow; chilliness is felt, and a cold perspiration may issue from the surface: all which symptoms disappear when the expulsive movement takes place. Then the face appears flushed, the pulse becomes quicker, fuller, and stronger, and rarely subsides till some time after all vomiting has ceased. If, after a brief interval, the expulsive action be not renewed, a state of languor succeeds, with tendency to sleep, and generally a considerable flow of warm perspiration.

Such are the effects of an emetic, when given in a dose sufficient to produce vomiting; but, if given in a smaller quantity, and repeated at intervals, it will merely create a state of nausea, during which the appetite is lowered, and arterial action is much diminished, while the function of absorption is roused to great activity.

The secondary effects of emetics depend upon the concussion of the frame, the equalization of the circulation, the increased secretion from the mucous membrane of the stomach, and also of the duodenum as well as the liver and pancreas, and frequently from the skin.

The secondary effects of nauseating doses are diminished arterial action and augmented absorption.

We shall now state a few of the morbid conditions in which these agents are suited, and a few of those for which they are unfit.

In fever. Whatever opinions may be entertained respecting the nature and origin of fever, there can be no question but that the sanguiferous system powerfully feels and shows disturbance, and in no point more conspicuously than in the capillaries. These become the seat of those morbid actions, to counteract which is the chief aim of the early treatment. By these vessels, too, are executed the functions of secretion, deposition of the nutrient material, exhalation, and, in some degree, the evolution of animal heat. The consequences of deranged action of the capillaries are—diminished or vitiated secretion, suspended nutrition, altered exhalation, and the animal heat augmented or diminished, or unequally diffused. But while the diseased impression is confined to the general circulation, which it always is for some time (varying in different cases and constitutions), the series of morbid actions may be arrested by venesection, purgatives, or more certainly by an emetic. This should be administered at as early a period of the disease as possible; but even should it fail in cutting short the febrile movement, still it clears the stomach, and fits it to retain whatever may subsequently be had recourse to in order to moderate or regulate the future condition of the system. Emetics invariably render the disease milder, owing to the greater freedom of the secretions which follows their use; and they may be advantageously repeated even in the more advanced stage, frequently inducing sleep and a moist state of the skin. They may be employed in epidemic, typhus, common fever, and exanthematous fevers, especially measles, scarlet fever, and small-pox. For the slight febrile affections of children, generally caused by something offending the stomach, nothing is so well suited or so efficacious as a gentle emetic. In bilious fevers emetics are required, especially at the beginning. In intermittent fevers, if given before the paroxysm, they early bring on the sweating stage, thus concentrating the fit into a short period. Their tendency to produce perspiration often renders them useful in rheumatic fevers. In common inflammation of the throat, and still more so in croup, emetics are of decided utility. In common catarrh they frequently shorten the disease; and in the suffocative catarrh and catarrh of old age, emetics mechanically unload the lungs, and render the respiration freer. Dr. James Clark and Dr Carswell even think that they can dislodge tubercular matter from the lungs in the early stages of consumption. (See Clark *on Consumption*.)

Few agents are more useful in hooping-cough than emetics; and in many cases of indigestion, especially if accompanied with sick headache or hypochondriasis, emetics give effectual relief.

Emetics are very improper where there is a disposition to apoplexy, or tendency of blood to the head, or where the patient is liable to hæmorrhage from any organ, or is subject to hernia. They are also to be avoided during pregnancy.

EMIGRATION, may be defined to be a man's leaving his native country with all his property to settle permanently in another. Emigration is therefore necessarily implied in the word colonization, and it is by the terms of our definition easily distinguished from a man's temporary absence from his native country and from the kind of absence specially called absenteeism.

Though a man may be properly called an emigrant who leaves Great Britain or Ireland, for instance, and settles in France or Germany or elsewhere in Europe, the term has in modern times come to have a more restricted and particular sense. By the term emigrant we generally understand one who leaves an old and thickly peopled country to settle in a country where there is abundance of land that has never been cultivated before, and where the native population is thinly scattered, and the foreign settlers are yet either few compared with the surface, or none at all. The countries to which emigration is mainly directed at present are the British possessions in North America, the United States of North America, and the great island of Australia with Van Diemen's Land.

An emigrant to any of these remote countries must be either a capitalist or a labourer, or he may combine in himself both conditions; but even a mere labourer cannot emigrate without some capital, though the amount may be only enough to convey him to the spot where his labour and skill will be in demand. It was long a prevalent notion among nations, or perhaps we may rather say with those possessed of power at the head of nations (who have generally been slower in learning any great practical truth than the mass of the people, whose understanding is sharpened by a nearer view of their own interest), that emigration should be discouraged or prevented, as tending to weaken a nation. The objection, we believe, was generally founded rather on a notion that the nation lost by its diminished population, than that it suffered from the abstraction of capital. As to the matter of population, however, some observers even then could not fail to remark, that emigration did not seem to diminish the population, but that on the contrary it seemed to be soon followed by an increase. This was observed with respect to Portugal at the time when she was extending her conquests and colonies, and is a fact confirmed by more recent experience, the explanation of which presents no difficulty. The abstraction of capital, skill, and industry might seem, and indeed is primarily, so much good taken from the mother country; but inasmuch as the emigrants retain in their new settlements, through the medium of commercial exchange which is daily becoming more rapid and easy, a connexion with the parent state, it may be and often is the fact, that they ultimately contribute more to the wealth of the mother country when in the new settlements than they could have done at home. Many of those, for example, who settle in the western States of America or in Canada with no capital beyond their hands, by their industry become the possessors of a well-cultivated piece of land, and ultimately consume more of the products of British industry, for which they must give something in exchange, than if they had remained in their native country. And as, in order that emigration to new countries may be a successful undertaking to those who emigrate, and ultimately advantageous to the mother country, there must be an emigration both of capitalists and labourers, it would seem to follow that a state, if it consult the happiness of its citizens, should place no impediments to the emigration either of capitalists of all kinds or of labourers or artizans of any kind, but should on the contrary give reasonable facilities. The objections that have been made and the legislative obstacles that once existed to the exportation of numerous articles from this country, and still exist with reference to some descriptions of machinery (for instance), are founded on a total misconception of the state and condition of newly settled countries, as to their capabilities for manufactures, and on an absurd notion that the exportation of anything can be prevented whenever the demand for it is sufficiently great to cover the risk of evading an absurd enactment. [CONTRABAND.]

If a state then should be wise enough not to discourage emigration, it may be asked, should it aid and direct it? So far as a state should aid and direct emigration, there must be two distinct objects kept in view by the state; one must be to benefit the parent country, the other to benefit those who emigrate. On the contrary, as to the individual who emigrates, whether he emigrates under the protection and direction of the government or not, his sole object is of course to better his own condition.

One cannot well conceive why a state, or any section or part of a nation, should make any contribution or raise any fund for the purpose of aiding emigration, except it be with the view of bettering the condition of some who cannot find employment at home, and at the same time adopting some systematic plan for improving the condition of those who are left behind. Yet any system of emigration thus conducted by government, or by societies, or by the inhabitants of particular districts, would fail in its primary object, relief to the emigrants, unless a corresponding amount of capital should be taken out of the country by other emigrants who might settle in the same place to which the emigrant labourers were sent. To effect such an adjustment between capital and labour, not only should both these elements of wealth in due proportion be transported to the new country, but such proportion should, for some time at least, be maintained by the body which superintends such system of emigration; an arrangement which seems impracticable, except by some such provisions as are hereinafter mentioned.

It is further to be observed that, as no persons can ever succeed as emigrants who are not sober, intelligent, and industrious, and as such alone are consequently fit people to go to a new country, such alone should be sent out by a state or a society, if it interferes in the matter of emigration. But if a large number of the most industrious labourers should emigrate from a given district, and leave behind them the worthless and idle, though the emigrants might better their condition and improve the settlement of which they go to form a part, the mother country would be no gainer by this change. We are not inclined to consider that any advantage, at all commensurate to the expense, would result from any emigration, however extensive, from districts where there is a superabundant and pauperized, or a pauperized and not superabundant population. If the idle, the ignorant, and the vicious, were exported wholesale, they would only die a few years sooner in the land of their new settlement, without conferring any benefit on it, and those of the same kind who were left behind would hardly be more susceptible of improvement for the absence of any part of their numbers which did not amount to pretty nearly the whole number; while the industrious and the intelligent, who, by the supposition, remain at home and are willing to labour whenever it is in their power, would hardly derive any benefit by this removal of the bad from among them, at all commensurate to the amount of capital which must be expended on such wholesale exportations. Besides, as already observed, unless a proper supply of emigrant capitalists can be secured, all general plans for the emigration of labourers can only lead to disappointment and starvation. Any plan therefore which shall have for its object the amelioration of a population sunk in ignorance or debased by pauperism, must be one of an internal character, one which must gradually and on certain fixed principles aim at removing the evils which exist in the social system. Emigration must be left to the free choice of individuals, and must be recommended to the young, the sober, and industrious solely on the grounds of offering to them a reasonable prospect of bettering their condition in a new country.

The disadvantages of emigration however, when there is no plan, no controlling or directing power, are obvious. Emigrants often go to a new country without any definite or clear notion of what they are going to. Dissatisfied or unhappy at home, imagination pictures to them a remote and unknown country as an asylum from all the evils of life: or if they have any distinct idea of the new kind of existence which they are going to adopt, they often underrate the difficulties of the undertaking, or form a false estimate of their own capabilities to meet them. It is no wonder then, that so many, on landing in the New World, are startled at the obstacles which then stare them in the face, and shut their eyes to the real advantages, such as they are, which a fertile unoccupied soil presents to a hardworking industrious man.

We have stated that any system of emigration for labourers without a corresponding emigration of capitalists would be fruitless; it is also obvious that if capitalists only were to emigrate without being able to secure a supply of labour, the result would be equally unfortunate. And further, it is clear that any system of emigration of labourers to Canada or the United States could produce no good effect, because voluntary emigration of labourers is still going on.

and cannot be checked, and the emigration of capitalists to the same countries is now equally beyond control or direction.

It seems that considerations like these have recently led to the formation of a scheme of emigration which is original in its design. We allude to the South Australian Colony, the First Annual Report of the Commissioners for which was ordered to be printed by the House of Commons, 28th July, 1836. To adopt the language of this Report, 'the distinguishing and cardinal principles of the colony of South Australia are, that all public lands shall be sold, and that the proceeds of the sale shall be employed in conveying labourers to the colony.' Further, 'it is essential to the prosperity of a new colony in which there are neither slaves nor convicts, that there should be a constant supply of free labourers willing to be employed for wages. No productive industry worthy of the name can be undertaken, unless several hands can be put on the same work at the same time; and if there be not, in a colony in which the compulsory services of slaves or convicts cannot be obtained, a constant supply of labour for hire, no extensive farm can be cultivated, no large and continuous work can be carried on, and the capital imported must perish for want of hands to render it reproductive.'

It is also the object of the Commissioners to prevent the labourers, for some time after their arrival in the colony, from purchasing land. It is proposed to effect this by fixing the price of land sufficiently high to prevent the labourer from being tempted too soon to exchange that condition which is for the time the most profitable both to himself and the body of emigrants for the apparently higher character of a landowner.

It is justly remarked in the Report that the result of such premature purchases 'would be alike disastrous to the capitalist and to the labourer; as the supply of labour for hire being thus diminished, improvements requiring the co-operation of many hands would be suspended, and capital would waste and perish for want of means to use it; and the labouring population becoming separated upon small patches of land, each family would be obliged to perform every species of work for themselves; and the absence of all division of employment and combination of labour would so reduce the efficacy of their industry, that instead of advancing in wealth and civilization, they would fall back to a semi-barbarous state.' Such a result has already been witnessed in numerous new settlements, and such a result must inevitably follow the dispersion of small capitalists and labourers who aspire to be land-holders over a large uncultivated surface, however rich it may naturally be. The practical problem which the Commissioners have undertaken to solve is not without its difficulties, and time alone can show how far they will succeed. In the mean time we recommend to the reader the perusal of the First Report, together with the other publications that have appeared on this interesting subject.

We know no recent publication which is better adapted to give a correct notion of the kind of difficulties which an emigrant has to meet, even under circumstances not the most unfavourable, than a little work entitled the 'Backwoods of Canada,' published under the superintendence of the Society for the Diffusion of Useful Knowledge.

The number of persons who, according to the Custom House accounts, have emigrated from the United Kingdom to the British colonies in North America, the United States, the Cape of Good Hope, and the British settlements in Australia, in each year from 1820 to 1836, has been as follows:—

Years.	British North American Colonies.	United States of America.	Cape of Good Hope.	Australian Settlements.	Total.
1820	17,921		1063	..	18,984
1821	12,470		404	320	13,194
1822	11,282		192	875	12,349
1823	8,133		184	543	8,860
1824	7,311		114	780	8,205
1825	8,741		114	485	9,340
1826	12,818		116	903	13,837
1827	12,648		114	715	13,477
1828	12,084		135	1056	13,275
1829	13,307		197	2016	15,520
1830	30,574		204	1242	32,020
1831	58,067		114	1561	59,742
1832	66,339	32,872	196	3733	103,140
1833	28,808	29,109	517	4093	62,527
1834	40,060	33,074	288	2800	76,222
1835	15,573	26,720	325	1860	44,478
1836	34,226	37,774	293	3124	75,417

The above statement is almost necessarily defective, because many persons proceed from the United Kingdom as emigrants on board vessels which are not wholly devoted to the conveyance of passengers, and of whom no record is kept at the Custom House. The following statement, giving the number of emigrants who landed at Quebec and Montreal, at New York, and in New South Wales, in each year from 1829 to 1836, is compiled from returns made by the government agents, and is probably correct as regards those particular places, which are the principal points to which the tide of emigration from this country is continually tending:—

	Quebec and Montreal.	New York.	New South Wales.
1829	15,945	11,501	564
1830	28,000	21,433	309
1831	50,254	22,607	457
1832	51,746	28,283	2,006
1833	21,752	16,749	2,685
1834	30,935	26,540	1,564
1835	12,527	[illegible]	1,428
1836	27,728	[illegible]	[illegible]

The countries from which the emigrants have proceeded who landed at Quebec and Montreal, as stated above, were—

	1829.	1830.	1831.	1832.	1833.	1834.	1835.	1836.
England and Wales	3,565	6,799	10,343	17,481	5,198	6,799	3,067	12,188
Ireland	9,614	18,300	34,133	28,204	12,013	19,206	7,108	12,590
Scotland	2,643	2,450	5,354	5,500	4,196	4,591	2,127	2,224
Hamburg and Gibraltar	..	..	..	15	..	..	..	..
Nova Scotia, Newfoundland, West Indies, &c.	123	451	424	546	345	339	225	235
Hanseatic Towns (Swiss and Norwegians)	..	..	..	..	..	..	..	485
	15,945	28,000	50,254	51,746	21,752	30,935	12,527	27,728

The arrivals at New York in the four years from 1829 to 1832, since which time this information has not been afforded, were—

	1829.	1830.	1831.	1832.
From England	8,110	16,350	13,808	18,947
Ireland	2,443	3,499	6,721	6,050
Scotland	948	1,584	2,078	3,286
	11,501	21,433	22,607	28,283

A large proportion of English emigrants who land at New York have no intention of remaining in the United States, but take that route in preference to the Saint Lawrence, the navigation of which is tedious and dangerous, and proceed to Upper Canada: it is not possible however to state precisely their ultimate destination. The distribution of those emigrants who landed at Quebec and Montreal during the last three years is given by the agent for emigration in Canada as follows—

	1834.		1835.		1836.	
LOWER CANADA.						
City and District of Quebec	1,850		600		1,500	
District of Three Rivers	250		135		200	
District of St. Francis and Eastern Townships	240		250		2,000	
City and District of Montreal	1,200		750		1,500	
Ottawa District	400		350		255	
		4,980		2,087		5,655
UPPER CANADA.						
Ottawa, Bathurst, Midland, and Eastern Districts to Kingston inclusive	1,000		2,000		2,000	
District of Newcastle and Townships in the vicinity of the Bay of Quinté	2,650		800		1,500	
Toronto and Home District, and Settlements round Lake Simcoe	5,000		2,500		5,000	
Hamilton, Guelph, and Huron Tract	2,000		1,500		1,400	
Niagara Frontier and District, and round the head of Lake Ontario to Hamilton	2,500		1,200		1,500	
Settlements bordering on Lake Erie, including the London District, Adelaide Settlement, and up to Lake St. Clair	4,500		1,500		2,000	
		22,650		9,500		13,400
Died at Grosse Isle			10		28	
„ at Marine Hospital, Quebec			2		56	
Returned to United Kingdom	400		117			
„ do. Europe					27	
Gone to United States	1,400		300		1,075*	
Died of Cholera	900					
		3,305		429		1,186
TOTAL		30,935		12,527		27,728

* Proceeded to the United States.

The emigrants who arrived at Quebec and Montreal in each of the years 1835 and 1836 were divided, as regards sex, &c., as follows:—

	1835.	1836.
Males	5,597	14,447
Females	3,866	7,833
Children under 14 years of age	3,064	5,448
	12,527	27,728
Of these there were sent out by parochial aid	1,043	4,640
Went at their own expense	11,484	23,088
	12,527	27,728

The parochial emigrants in 1836 were sent from Hampshire, Wiltshire, Norfolk, and Kent.

The following list of Reports may be useful.—

Report from Select Committee on Emigration from the United Kingdom, 1826. Three Reports from same Committee, 1826-27. Report to Colonial Department by Col. Cockburn, on the subject of Emigration, January, 1827. Reports from Commissioners for Emigration to the Colonial Secretary, 1832. Annual Reports from the Agent for Emigration in Canada, 1833 to 1836.

EMIR-AL-OMRAH, or more correctly *emîr-al-omarâ*, i. e. 'the prince of princes,' or 'chief of chiefs,' is the designation of an office under the caliphat, endowed with almost unlimited authority, which was created in the year of the Hegira 324 (A.D. 935), became hereditary in the year 333 (A.D. 944), and continued till near the middle of the following century. The disturbed state of the empire, in which the governors of the provinces frequently broke their allegiance to the sovereign, induced the caliph Al-Radhi, who had ascended the throne in the year 322 of the Hegira (A.D. 934), to seek for stronger aid in the management of public affairs than the previously existing office of a vizier, or prime minister, was able to afford; and with this view he sent for one of the refractory vassals, Mohammed ben Râyek, the governor of Waset, invited him to come to Bagdad, appointed him commander-in-chief of the army, and entrusted to him the superintendence of all his dominions, conferring upon him at the same time the title of emîr-al-omarâ, and directing his name to be inserted in the public prayers in the mosques throughout the empire, next to that of the caliph himself. The vizier Ebn Moklah, known as the reputed inventor of the Neskhi character, or Arabic current hand, was dismissed, and severely punished for an attempt to recover his station. Mohammed ben Râyek himself appointed a vizier in the person of Fadhl ben Jaafar, the governor of Egypt and Syria. Not two years elapsed after the elevation of Mohammed ben Râyek, before he was obliged to yield his place to the Turk Yahkam (called by Abulfeda, Bahkam), a freed slave, who had raised himself into power, and had been appointed governor of Ahwâz by Mohammed ben Râyek. This post he had been obliged to relinquish on account of the rising power of the Buides (Bawaihides) in Persia: he had in consequence taken possession of Waset, and now marched to Bagdad, and forced the caliph to submit to his dictation. Mohammed ben Râyek quitted the capital, but soon returned with an army, when a contest followed, which terminated in his being appointed governor of Harran, Roha (Edessa), Kinnesrin, and Awâsim, and subsequently of nearly the whole of Syria. Bahkam remained emîr-al-omarâ till his death, which took place shortly after the accession of Mottaki billah to the caliphat (A. Heg. 330, A.D. 941): he was, according to some, killed by the Curds on a hunting excursion; according to others, he was assassinated by order of Mottaki, whom his arrogant behaviour had exasperated against him. Abdallah al-Baridi, governor of Basra, made an unsuccessful attempt to possess himself of the office of emîr-al-omarâ. Kurtekîn, another Turkish chief, who succeeded him, held the office during eighty days, at the expiration of which Mohammed ben Râyek returned from Syria to Bagdad, took Kurtekîn prisoner, and was re-appointed emîr-al-omarâ by the caliph. But after a very short time Mohammed was assassinated by the order of Naser-ed-daulah, the governor of Mosul, who succeeded him during a period of three months. In A. Heg. 331 (A.D. 942), Mottaki appointed Tûzûn emîr-al-omarâ. In the ensuing year the caliph quitted Bagdad, and fled towards Mosul in consequence of a disagreement with Tûzûn; the latter followed him, as the caliph had offered terms for a reconciliation; but when they had met, Tûzûn ordered both the eyes of the caliph to be put out, led him back to Bagdad, and compelled him to resign the throne in favour of Mostakfi billah. In A. Heg. 334 (A.D. 945) Tûzûn died, and the Turkish guards at Bagdad chose Zairat, son of Shîrzâd, as his successor, in which capacity he was confirmed by the caliph Mostakfi. But before the end of the year Moëzz-ed-daulah, the Buide (Bawaihide) prince of Ahwaz, entered Bagdad at the head of an army; Zairak and the Turkish guards fled to Mosul, and the caliph created Moëzz-ed-daulah his emîr-al-omarâ. Of this appointment he had soon reason to repent; for Moëzz-ed-daulah dethroned him, and made Al-Moti-lillah caliph in his stead. 'The caliphat,' observes Abulfeda, 'which was conferred upon Moti-lillah, was divested of nearly every prerogative of sovereignty: the officers of Moëzz-ed-daulah ruled throughout Irak, and to the caliph nothing was left but what Moëzz-ed-daulah out of his own free will conceded to him.' The authority of Moëzz-ed-daulah was for a time contested by Naser-ed-daulah of Mosul; but in A. Heg. 337 (A.D. 948) Moëzz-ed-daulah took Mosul, and his opponent fled to Nisibis. Moëzz-ed-daulah now continued undisturbed in the possession of his high authority till his death, which took place A. Heg. 356 (A.D. 966). How great his power was cannot perhaps be better shown than in mentioning the fact, that he was the first Mohammedan prince who sold an appointment of judge (for 200,[illegible] dirhems), and that in a Sunnite country he, a Shiite, directed a public mourning in memory of the death of the caliph Hossain [Ali ben Abi taleb]. He was succeeded by his son Bakhtiar Azz-ed-daulah, an indolent and voluptuous prince, between whom and the chiefs of the Turkish body-guard, Sebuktekin and Aftekin, frequent dissensions, and at last open hostilities took place. Bakhtiar was obliged to quit Bagdad, and to apply for assistance to his cousin Adad-ed-daulah. The latter conducted him back to the capital, but induced him to resign his office, which he himself assumed, till compelled by his father Rokn-ed-daulah to restore it to Bakhtiar. At the suggestion of Sebuktekin, Mosti-lillah had, in A. Heg. 363 (A.D. [illegible]), abdicated the caliphat in favor of Tayi-lillah his son. In A. Heg. 366 (A.D. 976), Rokn-ed-daulah died, and Adad-ed-daulah, who succeeded him as sovereign of Persia Proper, Arjan and Kerman, now for the second time prevailed on Bakhtiar to surrender to him his post as emîr-al-omarâ. A war followed, in which Bakhtiar was taken prisoner and executed. Bardas, a rebel governor under the Greek empire, applied to Adad-ed-daulah for support; to prevent which Nicephorus was sent twice as ambassador from the court of Constantinople to that of the emir. Adad-ed-daulah remained emîr-al-omarâ till his death, A. Heg. 372 (A.D. 982). He encouraged literature and science, and was himself an accomplished poet. He restored and embellished the principal towns of the empire, which had been damaged during the civil wars: at Bagdad he erected an hospital; and in Persia Proper he inclosed the river Cyrus [Bend-Emir] with extensive dykes. After his death, his son Samsam-ed-daulah was chosen emir; but in A. Heg. 376 (A.D. [illegible]) his brother Sharf-ed-daulah forced the caliph to confer the dignity upon him, and Samsam-ed-daulah was blinded. Sharf-ed-daulah died A. Heg. 379 (A.D. 989-990), and was succeeded by his brother Behâ-ed-daulah, who remained emîr-al-omarâ till his death; but was obliged to make concessions to the Turkish body-guards, and thereby diminished his power. He induced the caliph Tayi-lillah to resign in favor of Kader-billah, A. Heg. 381 (A.D. [illegible]). Behâ-ed-daulah was, in A. Heg. 403 (A.D. 1012) followed by his son Soltan-ed-daulah, who was compelled by a military insurrection, in A. Heg. 411 (A.D. 1020), to appoint his brother Mushrif-ed-daulah commander-in-chief of the army, by whom he was subsequently deprived of his office. Soltan-ed-daulah died in A. Heg. 415 (A.D. 1024); Mushrif-ed-daulah in the following year. After an interval of [illegible] years, during which Bagdad seems to have suffered much from the insolence of the Turkish guards, Jelâl-ed-daulah, another son of Behâ-ed-daulah, was invited by the army to come from Basra to the capital; and the caliph confirmed his election as emîr-al-omarâ. During his administration the caliph Kader-billah died, A. Heg. 422 (A.D. [illegible]), after a nominal reign of forty-one lunar years, and was followed by his son Kâyim-bi-amr-allah. The latter, instead of seeking an intimate union with Jelâl-ed-daulah, whom he considered to be of little influence, made a treaty with another Buide prince, Fîrûz Abû-Kâlenjâr of Shiraz. Insurrections at Bagdad, and predatory incursions of the of wandering Arabs became more and more frequent; and the authority of both the caliph and the emir-al-omará, who were moreover often of different opinions, seemed to be at an end. When Jelál-ed-daulah died, A. Hej. 435 (A.D. 1043), Emád Abú Kálinjár was elected emir-al-omará. During his administration the power of the Arabian empire began to yield to the conquest of the Seljuks, who had taken possession of Jorján, Tabaristán, Khowarezm, and the Persian Irák, and were advancing towards Bagdad. He died on an expedition into Kermán against Bahrám, the governor of that province, who had broken his allegiance to the court of Bagdad. His son Malek-er-Rahim succeeded in suppressing the revolt in Kermán; but in the mean time Togrul Bek, the sovereign of the Seljuks, had taken possession of Ghilán, and a dissension which had broken out between the caliph and Basasiri, the governor of Irák, rendered the conquest of that province and of the capital itself a matter of little difficulty for the Seljuks. In A. Hej. 447 (A.D. 1055) Togrul Bek entered Bagdad. Malek-er-Rahim abdicated his office, and remained as a prisoner in the hands of Togrul, who thus put an end to the dominions of the Bowide emir-al-omarás.

([illegible], *Commentatio exhibens historiam Emirorum al Omarâ sub Chalifis*, Gottingae, 1816, 4to.; Wilken, *Mirchond's Geschichte der Sultane aus dem Geschlechte Bujeh*, Berlin, 1835, 4to.)

EMLY, a bishop's see in the ecclesiastical province of Cashel in Ireland. The chapter consists of dean, precentor, chancellor, archdeacon, and four prebendaries. This diocese lies in the counties of Tipperary and Limerick, and contains forty-two parishes, constituting seventeen benefices. Its extent is about forty-one English miles by fifteen. In 1792 there were in Emly diocese thirty-five churches of the establishment; in 1834 the numbers were, churches of the establishment, eleven; other places of worship in connexion therewith, four; Roman Catholic chapels, thirty-one. In the same year the total population was 98,302, of whom there were 1246 members of the established church; 97,115 members of the church of Rome; one Presbyterian; and one other Protestant dissenter; being in the proportion of rather more than ninety-eight Roman Catholics to one Protestant of whatever denomination. In the same year there were in this diocese seventy-four schools, educating 4235 young persons, being in the proportion of 4¼ per cent. of the entire population under daily instruction; in which respect Emly stands last but one among the thirty-two dioceses of Ireland, being only superior in educational rank to the diocese of Ardfert and Aghadoe.

The see of Emly was founded by Saint Ailbe, who died in the year 527. It was united to the archiepiscopal see of Cashel in 1569, which union still subsists. [CASHEL.]

(Beaufort's *Memoir of a Map of Ireland*; *Parliamentary Reports*, *&c.*)

EMMANUEL COLLEGE, Cambridge, was founded in 1584, by Sir Walter Mildmay, on the site of the monastery of the Black Friars, which he had purchased of a Mr. Sherwood. The original foundation was only for a master, three fellows, and four scholars. There are now twelve, which are called foundation fellowships, besides one founded by Mr. Gillingham, the holder of which receives a dividend arising from a distinct estate, but is in most other respects on an equality with the foundation fellows. These fellowships are open to all counties, but there cannot be more than one fellow of the same county at the same time; and no one can be a candidate till he has taken the degree of B.A., or is at least B.A. of the third year. He must be twenty-one years of age, and have been six years a member of the university. The four senior fellows are obliged to take priests' orders. Sir Wolstan Dixie, some time lord mayor of London, a contemporary of the founder, gave lands for the support of two fellows, distinct from those of the foundation. These fellows have no vote in college affairs, nor have they any claim to college livings: candidates for these fellowships must have taken the degree of B.A., and must be related to the founder, or have received their education at Market Bosworth School. There are likewise four scholarships of Sir Wolstan Dixie's foundation, subject to the same restrictions. The foundation scholarships of Emmanuel College are open to Englishmen of all counties, but there cannot be more than three scholars of the same county at the same time. The scholars receive upwards of 12*l.* per annum in addition to the weekly payment of 1*s.* 6*d.* during residence. Besides these there are many scholarships and exhibitions, founded by various benefactors, to be given to the candidates most distinguished for learning and exemplary conduct. Among the principal are five by Dr. Thorpe of 24*l.* per annum, with a preference, *cæteris paribus*, to the sons of orthodox clergymen; one by Mr. Hubbard of 12*l.* per annum to the best of Dr. Thorpe's scholars; one by Mr. Ash of 10*l.* per annum; four by Archdeacon Johnson of 24*l.* per annum, with a preference to candidates from Oakham and Uppingham schools; one by Dr. Smith of 16*l.* per annum, with a preference to Durham and Newcastle schools; two by Mr. Richards of 12*l.* per annum, with a preference to Christ's Hospital; one by Sir Busick Harwood of 10*l.* per annum, with a preference to a medical student; and two by Lady Romney of 12*l.* per annum each. Various annual prizes are given in this college; amongst them, plate to the amount of 12*l.* to the best proficient among the commencing bachelors of arts. The number of members of this society upon the college boards, according to the University Calendar of 1837, is 224. There are eighteen benefices in the patronage of the society. To one of these, the rectory of Twyford in Hants, the college nominates, and the heirs of Carew Mildmay, Esq., present: to two others, Wallington rectory in Herts, and Fressingfield-cum-Withersdale vicarage in Suffolk, the master nominates, and the society presents: to two other livings a Dixie fellow is to be presented alternately with one on the foundation. A copy of the statutes of Emmanuel College is preserved among the Sloane Manuscripts in the British Museum, No. 1739. Among the eminent persons who have been members of Emmanuel College, were Bishop Hall, Matthew Poole, author of the 'Synopsis Criticorum,' Joshua Barnes, Dr. Wallis the mathematician, Sir William Temple, Anthony Blackwall, and Dr. Richard Farmer, the commentator upon Shakspeare, who was master of this college. (Lysons' *Magna Brit.—Cambridgeshire*, p. 128; *Cambridge University Calendar for* 1837.)

EMMERICH, or **EMRICH**, a town on the left bank of the Rhine, with a good harbour, in 51° 50′ N. lat. and 6° 13′ E. long. It lies in the circle of Rees, in the northern extremity of the county or administrative circle of Dusseldorf, in Rhenish Prussia, close to the frontiers of Holland. It was formerly in the Hanseatic league. There are 4 churches, 2 Roman Catholic and 2 Protestant, a Mennonite place of worship, a minor gymnasium, an ecclesiastical seminary, 2 orphan asylums. The town is surrounded by walls and ditches. In 1765 the population was 3491; in 1817, 4412; and in 1831, 5569. There are manufactures of woollens, stockings, hats, galloons, soap, oil, &c., besides tanneries, wax-bleaching grounds, and a public salt factory.

EMMIUS UBBO, was born at Gretha, in East Friesland, in the year 1547. His father was a clergyman of the Lutheran communion. Emmius studied at Bremen, Rostock, and lastly at Geneva, where he became intimate with Beza. He afterwards returned to his native country, and in 1580 was made rector of the school of Norden, in East Friesland. In 1594 he was appointed to the chair of history and the Greek language in the College of Groningen, and when the University of Groningen was instituted in 1614 Emmius was made rector of the same. He was deeply imbued with classical learning, and he excelled in the knowledge of history, antient and modern. Among his historical works, the most important is the 'Vetus Græcia Illustrata,' 3 vols., Leyden, 1626. The first volume consists of a description of antient Greece, including the islands; the second contains a history of that country; and the third, which is the most elaborate and interesting, gives an account of the political institutions and social manners of the various Greek states; namely, of Athens, Sparta, Crete, Argos, Thebes, Corinth, Syracuse, Corcyra, Samos, Chios, Rhodes, Achaia, Ætolia, Massilia in Gaul, Locri in Italy, and Lycia in Asia. The author has also introduced a brief sketch of the Carthaginian republic. The appendix contains an account of the decline and fall of three of the above states, Athens, Carthage, and Sparta. Emmius gives a long list of antient authors from whom he derived his information. The work is altogether useful, and was still more so at the time of its appearance, when good works on classical learning were more scarce than they are at present. The other works of Emmius are, 2. 'Opus Chronologicum,' or a General Chronology, fol., 1619; 3. 'Rerum Frisicarum Historia, a gentis origine usque ad ann. 1564,' Leyden, 1616.

It is a good history of Friesland, the author's native country, to which is added 'De Frisiorum Republica Commentarius,' published before separately at Embden, 1619. 4. 'De Agro Frisiæ inter Amasum et Lavicum flumina;' 5. 'Historia nostri Temporis,' Groningen, 1732. Emmius Ubbo died in 1625, in his 78th year. At the time of his death he was busy writing a history of Philip of Macedonia, the father of Alexander the Great, which he intended as a warning to the republic of the United Provinces against the designs and intrigues of their enemies. He had written as far as the fifteenth year of Philip's reign. Emmius was acquainted with, and appreciated by, most of the learned men of his time, such as De Thou, Gruter, Gomar the theologian, Pezelius, and others. He was especially a favourite with William Louis, of Nassau, the governor of Friesland and Groningen. (*Elogium Ubbonis Emmii, Historiarum et Græcæ linguæ in Academia Groningensi Professoris ejusque Rectoris primi*, Groningæ, 1628.)

EMPALEMENT, an obsolete name of the stamen of a flower.

EMPANNEL, the writing and entering the names of a jury on a parchment schedule or roll of paper by the sheriff, which he has summoned to appear for the performance of such public service as juries are employed in. [PANEL.]

EMPE'DOCLES, a native of Agrigentum in Sicily, who flourished about B.C. 450: he was distinguished not only as a philosopher, but also for his knowledge of natural history and medicine, and as a poet and statesman. It is generally believed that he perished in the crater of Mount Ætna. The story that he threw himself into it in order that by disappearing suddenly and without a trace, he might establish his claim to divinity, and the charge of arrogance founded upon that pretension, seems to have rested on a misconception of his doctrine that the human soul (and consequently his own) is divine and immortal.

His masters in philosophy are variously given. By some, like the Eleatæ generally, he is called a Pythagorean, in consequence of a resemblance of doctrine in a few unessential points. But the principles of his theory evidently show that he belongs to the Eleatic school, though the statement which makes him a disciple of Parmenides rests apparently upon no other foundation than a comparison of their systems; as, in like manner, the common employment of the mechanical physiology has led to an opinion that he was a hearer of his contemporary Anaxagoras.

He taught that originally All was one:—God, eternal and at rest: a sphere and a mixture (σφαῖρος, μίγμα)—without a vacuum—in which the elements of things were held together in undistinguishable confusion by love (φιλία)—the primal force which unites like to unlike. In a portion of this whole, however, or, as he expresses it, in the members of the Deity, strife (νεῖκος)—the force which binds like to like—prevailed and gave to the elements a tendency to separate themselves, whereby they first became perceptible as such, although the separation was not so complete, but that each contained portions of the others. Hence arose the multiplicity of things: by the vivifying counteraction of love organic life was produced, not however so perfect and so full of design as it now appears; but at first single limbs, then irregular combinations, till ultimately they received their present adjustments and perfection. But as the forces of love and hate are constantly acting upon each other for production or destruction, the present condition of things cannot persist for ever, and the world which, properly, is not the All, but only the ordered part of it, will again be reduced to a chaotic unity, out of which a new system will be formed, and so on for ever.

There is no real destruction of anything, only a change of combinations. It must be remarked that the primal forces, love and hate, must not be supposed to be extrinsically impressed upon matter; on the contrary, while strife is inherent in the elements separately, love is in the mass of things—nay, more, is one with it—God. Of the elements (which he seems to have been the first to exhibit as four distinct species of matter), fire, as the rarest and most powerful, he held to be the chief, and consequently the soul of all sentient and intellectual beings which issue from the central fire, or soul of the world. The soul migrates through animal and vegetable bodies in atonement for some guilt committed in its unembodied state when it is a dæmon; of which he supposed that an infinite number existed. The seat of the dæmon when in a human body is the blood.

Closely connected with his view of the objects of knowledge was his theory of human knowledge. In the m, separation of the elements it is only the predominant that the senses can apprehend, and consequently, although man can know all the elements of the whole singly, he unable to see them in their perfect unity wherein con their truth. Empedocles therefore rejects the testimony the senses, and maintains that pure intellect alone arrive at a knowledge of the truth. This is the attribute the Deity, for man cannot overlook the work of love in its extent; and the true unity is only open to itself. H he was led to distinguish between the world, as presented to our senses (κόσμος αἰσθητός), and its type the intellectual world (κόσμος νοητός).

His explanation of the cognitive faculty, which re upon the assumption that 'like can only be known by l is drawn naturally enough from his physical view. M capable of knowing outward things, since he is, like th composed of the four elements, and of the two forces and hate; and it is especially by the presence of love w him that he is able to arrive at an intellectual knowle the whole, however imperfect and inferior to the divine.

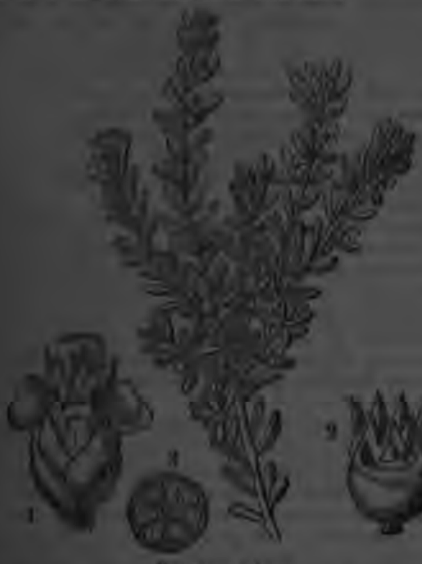
The Fragments of Empedocles were published with commentary by Fr. W. Sturz, Leipzig, 1805, 8vo.; see Empedoclis and Parmenidis *Fragmenta, ex Cod. T Bibl. restituta et illustrata*, ab A. Peyron, Lips. 1810.

EMPEROR, from the Latin *Imperátor*. Among early Romans the title of Imperator was bestowed by acclamations of his soldiers in the camp and by a vote the Roman senate, on a commander-in-chief who had nalized himself by killing a certain number of the ene (Tacit. *Annal.* iii. 74.) The term was gradually exten to signify a commander-in-chief sent on any important pedition. (Cic. *Pro Lege Manil.*, c. 2.) But it still tinued usual for the appellation to be bestowed as a sp title of honour for some military service: thus we find the small military exploits of Cicero conferred on him the of Imperator. C. J. Cæsar assumed the name as a prænom (Imperator C. J. Cæsar), a practice which was followed his successors, as we may observe on their coins. tonius, *Cæsar*, 76.) As examples of this title see the of ANTONIUS, AURELIUS, &c. On the reverse of the of Aurelius we observe Imp. VIII., that is, Imperator vum, or imperator the eighth time, which shows, as can be proved from a variety of examples, that the R emperors often assumed the title on special occasions they or their generals had obtained some signal This term Imperator then, it will be observed, under early emperors, cannot be considered as denoting sovereign power. It was indeed given to private indi on the occasion of great military success, certainly as as the time of Hadrian, and perhaps later. (Appian, *Wars*, lib. 2.)

After the time of the Antonines the term Impe seems to have gradually grown into common use as the titles which expressed the sovereign of the Roman though the name Princeps was also long used as ind the same rank and power. (See the Dedication of J. tolinus to Constantine.) It may be difficult to state this term Imperator became exclusively the designat the Roman sovereign. In the introduction to the D (De Conceptione Digestorum), Justinian assumes the of Imperator Cæsar Flavius Justinianus, &c., se Augustus. [AUGUSTUS.] In the proemium to the Insti Justinian uses the terms Imperatoria majestas to ex his sovereign power, and yet in the same paragraph calls himself by the name of Princeps, a term which from the time of the so-called Republic, and expressed precedence given to one particular member of the sen The term Princeps was adopted by Augustus as the invidious title of dignity, and was applied to his succes

From the emperors of the West this title, in the 800, devolved to Charlemagne, the founder of the or German empire of the West. Upon the expira of the German branch of the Carlovingian family, imperial crown became elective, and continued so u the last century. The title of emperor of Germany now longer exists, Francis II. having laid it aside, and assum the title of emperor of Austria. [AUSTRIA, p. 151.] T only other European potentate who uses the style of em peror is the autocrat of Russia, the monarchs of wh country, about the year 1520, exchanged their former t of Asti or grand duke of Russia, for that of Czar or Tzar. [Czar.] In early times it was asserted by the civilians that the possessors of the imperial crown gave to the emperors of Germany, as titular sovereigns of the world, a supremacy over all the kings of Europe; though such was never attempted to be exercised; and they denied the existence of any other empire: but in spite of this denial it is certain that several of the kings of France of the second race, after they had lost the empire of Germany, styled themselves Basileus and Imperator. Our own King Edgar, in a charter to Oswald bishop of Winchester, styled himself 'Anglorum Basileus omniumque regum insularum oceani quae Britanniam circumjacent, cunctarumque nationum quae infra eam includuntur *Imperator et Dominus*.' Alfonso VII. also, in the 12th century, styled himself emperor of Spain. It cannot be easily shown how the title and rank of king and emperor have been modified, as it were, in passing through the ordeal of the middle ages.

EMPETRACEÆ, a small natural order of polypetalous exogens related to Euphorbiaceæ. They consist of a number of heath-like plants with minute flowers, having a calyx with a few imbricated sepals that change into about three membranous petals, a small number of hypogynous stamens and a superior ovary with from three to nine cells, in each of which there is a single ascending ovule. The fruit is fleshy and berried. They are small acrid plants, of no known use. Empetrum nigrum, the crakeberry or crowberry, is wild on the mountainous heaths in the north of England. Its black fruit forms an article of food in the northern parts of the world, but is reported to be unwholesome, and to cause headach. A sort of wine has been prepared from it for many centuries in Iceland and Norway; whence the report of real wine which was used at the sacrament being made in these countries.



Empetrum nigrum.
1, a female flower, much magnified; 2, a fruit; 3, a transverse section of the same.

EMPHASIS, in articulation, is the mode of drawing attention to one or more words in a sentence by pronouncing them with a greater volume and duration of sound, and in a higher or lower note, than the adjoining words. In written language there are several symbols by which emphasis is denoted. In manuscript the emphatic word is commonly underlined; in printing it is common to employ a different character, particularly the inclined character called the Italic. The German printers have introduced the mode of placing the letters of the emphatic word farther apart from each other. In modern languages the employment of some symbol for emphasis is more requisite than in the ancient languages. In the latter, where the arrangement of words was less fixed, it was generally practicable by the mere position of a word in a sentence to denote its emphatic power. Thus, in the Latin language, the first word of a sentence, or even of a clause, is generally emphatic; so also is the last word; and even in the middle of a sentence the verb is often so placed as to give emphasis to the preceding word. Indeed so closely connected is the order of words in a Latin sentence with the principle of emphasis, that the utter neglect of this principle in the schools of the present day may be set down as one of the chief obstacles in the acquirement of the Latin language.

EMPIRIC. This word is derived from the Greek *Ἐμπειρικός*, empeirikos, and means a man who derives his knowledge from experience. A medical sect which arose in opposition to that of the dogmatics assumed the name of empirics. *Serapion* of Alexandria and *Philinus* of Cos are regarded as the founders of this school. Ever since the world has existed, the human mind, in striving to find out the principles of truth, has considered the matter in two opposite ways. According to one system, the human mind contains the seeds of knowledge; according to the other, the mind is nothing but a blank sheet of paper, on which experience writes that which man perceives through the senses. Aristotle and Plato are still the representatives of the two opposite systems.

The science of medicine has been of necessity under the influence of one of the two opposite opinions, and the doctrine of Serapion or Philinus is nothing but the application of the Aristotelian theory, that nothing can be known by the understanding which has not been previously known by the senses.

Accordingly they maintained that experience was the only true knowledge which was derived from the unerring testimony of the senses; that dogmatism was erroneous, because it derived its principles from mere imagination. They opposed to the theorists their contradictions, and sneered at their learning and acuteness of reasoning as inadequate means of curing diseases.

The empirics admitted three kinds of experience, the one acquired by chance, the second by experiments, the third by imitation; and these three they called the tripod of medical science. However, it is evident that their mode of experience is nothing but a disguised mode of reasoning by analogy. Epilogism, as they called it, is as theoretical as pure dogmatism; for, how can we judge by analogy, if we do not assume some general laws to which the particulars are subjected?

If the empirics had remained true to their principles their name would stand high among the medical profession. But having abandoned the study of nature, and with it all scientific pursuits, they sank into such disrepute, that their name became a stigma. And even in our days when the natural sciences have, by the impulse given by Lord Bacon to genuine experiment, risen to a high degree of perfection, and empiricism is the character of modern science and philosophy, the name of empiric is still bestowed as an opprobrious term upon all ignorant pretenders in the medical art. (Celsus, *De Medicina*; Curt Sprengel, *Geschichte der Medizin*.)

EMPYREUMA denotes the peculiar and disagreeable smell and taste resulting from the action of a considerable degree of heat upon vegetable or animal substances in close vessels, which prevent such an access of air as is required for perfect combustion: in this way destructive distillation goes on so as frequently to produce an oil which has a strong, burnt, or, as it is termed, empyreumatic smell and taste.

EMS, a river in the north-west of Germany, which has its source in 51° 50′ N. lat., and 8° 41′ E. long., on the Havelhof, at the foot of a hill called Stapeling, which is at the south-eastern end of the Teutoburg Forest, and to the north-west of the town of Paderborn in Westphalia. From this point the river pursues a sluggish westward course between low banks to Rietberg, then turns to the north until it approaches Harsewinkel, where it bends again to the west past Warendorf and Telgte, and thence flows north-westwards to Schüttorf, in Hanover, below the town of Rheine, where it quits the Prussian territory. At Fuestrup, about five miles below Telgte, it is from *four* to five feet deep; and about five miles lower down it becomes navigable for small flat-bottomed vessels. It enters the Hanoverian dominions above Schüttorf, and traverses them for about 70 miles. The general direction of this part of its course, in which it makes numerous bends, is due north, until it quits the landrostei or circle of Osnabrück, in passing through which it approaches within a short distance of the town of Lingen, and has that of Meppen on its right bank. The Ems in this part, though full of water in the rainy season, is so shallow in dry weather that a canal called the Ems canal, has been opened at a very heavy expense from Haukensfähe, about eight miles above Lingen, which runs parallel with the river, has a depth of five feet, and rejoins the Ems at the confluence of the Hase at Meppen. From this town to Papenburg its bed has been deepened, so that in the shallowest spots it has a depth of three feet. Just above Papenburg, which lies on the borders of the circle of Aurich, or East Friesland, the river winds eastwards, and then inclining somewhat to the north-east, runs on to Leer, whence it pursues a northerly course till it has passed Vornhasen, and from this spot turns to the north-west, and ultimately enters the Dollart, a bay of the North Sea, in 53° 18′ N. lat. The Oster (East) and Wester (West) Ems, which are formed by the sand banks Ransel and Borkum-rif, are the channels by which the Ems discharges its waters into the North Sea. Between the Ransel and Dollart the Ems is wide, and separates East Friesland from the Dutch province of Groningen. The Ems below Leer widens to a breadth of 300 feet, and between the Dutch and Hanoverian territories its width varies from five to nine miles. The whole length of this river is estimated at about 210 miles, and it is navigable for vessels of 80 or 100 tons burden as high as Papenburg, where it ceases to be affected by the tides. There are bridges across it at Telgte, Wiedenbrück, Wahrendorf, Schönflint, Greven, Hembergen, and near Rheine, in Westphalia, and at Meppen in Hanover. Its principal tributaries on the right bank are the Hase, which, passing Osnaburg, falls into it at Meppen, after a course of about 125 miles; and the Leda, which enters Hanover from the duchy of Oldenburg, and joins the Ems near Leer, after a course of about 56 miles. On the left bank the Ems receives the Aa to the south-west of Papenburg. The basin of the Ems has an area of about 4914 square miles, the smallest area of any of the rivers which fall into the North Sea.

The Ems is mentioned by Roman writers under the Latinized form Amisia. (Tacit. *Annal.* i., 60, 63, &c.)

EMU. [STRUTHIONIDÆ.]

EMULSION, a term applied to mixtures which generally have a milky appearance, and which, in some cases, are partial solutions, in others merely mechanical suspensions, of oily or resinous substances: thus the oil of the almond seed may be for a time diffused through water by trituration, but will ultimately separate and float on the surface. Many resins are formed into emulsions by means of the yolk of an egg or of gum-arabic; while gum-resins contain in themselves the means of forming emulsions with water. Frequently syrups and distilled waters are added to render the compound more palatable; but alcohol and acids should never be used. Emulsions should be used soon after being formed, as in a few hours the constituent parts separate or become acid.

EMYDOSAURIANS. [CROCODILE, vol. viii. p. 162.]

EMYS. [TORTOISES.]

ENALIOSAURIANS, a name for certain fossil marine lizards. [ICHTHYOSAURUS, &c.]

ENAMEL (of the Teeth). [DENTITION.]

ENAMELS are vitrifiable substances, or a peculiar preparation of glass, to which different colours are given, sometimes preserving, sometimes depriving it of its transparency. Authors distinguish three kinds of enamels; those which are used to imitate precious stones, those employed in enamel painting (painting on enamel), and those with which an infinite variety of small works are made. The preparation of enamels is very various. In general ten parts of lead and three parts of tin may be oxidized by continued heat and exposure to air. To the mixed oxides thus obtained must be added ten parts of powdered quartz or flint and two parts of common salt, and the whole must be properly melted in a crucible; thus we obtain a white enamel and the basis of coloured enamel, metallic oxides being added in the preparation at the very beginning to give the required colour. The addition of oxide of lead or antimony produces a yellow enamel; reds are obtained by a mixture of the oxides of gold and iron; that composed of gold is the most beautiful and durable. The oxides of copper, cobalt, and iron, give greens, violets, and blues; and a great variety of intermediate colours is produced by mixing them in different proportions. The oxides are sometimes mixed before they are united to the vitreous basis. These are the principal ingredients in the composition of enamels; but the proportions in which they are used, the degree and continuance of the heat required for their perfection, are secrets which the manufacturers carefully keep to themselves as far as they are able.

ENAMELLING is of great antiquity, and was practised by the Egyptians, from whom it probably passed to the Greeks, and subsequently to the Romans, who are supposed to have introduced the art into Britain, because Roman antiquities have been dug up in different parts of our island in which parts of the ornaments consist of enamels. The art was in use also among the Britons, the Saxons, and the Normans successively, as is proved by various specimens still existing; and it would not be difficult to trace its progress down to our own times. It appears, however, that antiently enamels were principally applied to ornamental purposes, but since the invention of clocks and watches their usefulness has increased in an extraordinary degree, there being probably no substance for dial-plates equal to enamel in durability and beauty. The various processes in the practice of enamelling have probably never been completely made known to the public; they require extraordinary care and attention, and artists who may have been so fortunate as to discover any improved mode of operating are commonly too jealous to make it known.

Enamels being commonly laid on a metal ground, the first business is to prepare the plates, technically called *coppers*, to receive the enamel. This preparation requires much care and nicety, and the process is extremely curious. The metals used to enamel upon are gold, silver, and copper. Of the other metals some are too fusible to bear the fire, and the others, as platinum, &c., are too *strong*, as it is termed, for the enamel. The best substance to enamel upon is gold, the richness of the colour giving a beautiful tinge through the enamel; but, except for watch-cases and valuable articles of jewellery, copper is generally used on account of its cheapness. Both the gold and the copper should be of the finest kinds.

Enamelling is now divided into two branches, dial-plate enamelling and transparent enamelling; the former including the manufacture of clock and watch plates, with fluxed plates for enamel painting; the other the enamelling of watch-cases, brooches, and other trinkets. The former is divided also into hard and soft or glass enamelling; the hard requiring the most time, skill, and labour. The coppers being duly prepared, the next process is that of enamelling, properly so called.

The enamel as it comes from the maker is commonly in small cakes four, five, or six inches in diameter. In preparing it for use it is split, by means of a small hammer applied to the edge of the cakes, into thin flakes, which are put into an agate mortar and finely pulverized, and then washed with water. The moistened mass is then laid very smooth on the metal ground with a spatula, and when dried is melted, or, as it is called, fired, under a muffle, in a small furnace heated with coke and coal. The back of the coppers is first covered with enamel, and then the face, to which two coats are given, the operation of firing being applied to each. The plates are then carefully polished, for which various substances are used; and when this is complete, they are put for the third and last time into the fire before painting.

ENAMEL PAINTING, which should be called painting on enamel, is of modern date. It was indeed long believed that the encaustic painting of the antients was the same thing as our enamel painting. But though the antients possessed the art of colouring glass, which might have led to enamel painting, they do not seem to have acquired the latter art, the invention of which, as it is practised in our days, is ascribed to the French. In 1632, Jean Toutin, a goldsmith at Châteaudun, painted on enamel, and he and his disciple, Gulden, taught others. Jean Petitot, born at Geneva in 1607, an admirable painter in miniature, carried the art of painting on enamel to a degree of perfection never before attained. He resided long in England, and French writers affirm that he obtained the knowledge of the most beautiful and durable colours for enamel painting from Sir Theodore Mayence, at London, an eminent physician and chemist, who generously communicated his secrets to him, and recommended him to Charles I., after whose death he went to Paris, where he was highly favoured by Louis XIV., and gained a large fortune. After the revocation of the edict of Nantes he withdrew to Geneva. The difficulty of preparing the plates for enamel painting, and more especially the care and caution re quired in burning in the colours, with the very great risk attending the operation, had, till within our own memory, restricted the ordinary size of flat enamel plates, and consequently of enamel paintings, to five or six inches; and French writers think it would be little short of madness to attempt such works on a larger scale. But English artists have of late years so far exceeded these limits, that it would be absurd to hazard any dogmatic opinion respecting the possible extent to which they may go. The late Mr. Horace Hone was, we believe, the first who ventured much to exceed the usual size. We have seen a beautiful whole-length portrait of a lady, which, if we remember rightly, was about twelve inches high and broad in proportion; but this has been far exceeded by Mr. H. P. Bone, whose copy from the famous picture of Bacchus and Ariadne by Titian, in the National Gallery, measures 18 inches by 16½. The same artist had also in the exhibition of the Royal Academy, this year, 1837, a copy of the Virgin and Child, by Vandyke, of even larger dimensions.

When we contemplate such works finished in the most exquisite manner, we cannot but admire the courage of the artist in undertaking them. The brilliancy and permanency of the colours are indeed a great temptation and an ample reward for success. But chances of failure are great, and increase, as we understand, with the size of the work, which is not safe till it has undergone the operation of being exposed to the fire for the last time. Indeed the whole process from the very outset requires in every stage the utmost care and attention, and a degree of skill in the management which only long practice can give. No fault in the design can be corrected; it must be traced in the first instance with perfect accuracy: the fire may destroy the work, but what it fixes, whether good or bad, is unalterable.

ENCAMPMENT is the lodgment or station of an army, with its artillery, baggage, and stores, when it has taken the field for the purpose of a review, or of acting against an enemy.

Under the word CAMP (ROMAN) there has been given an account of the ancient castrametation, and, till the employment of fire-arms in war, it is probable that the manner of occupying ground for military purposes which had been adopted by the Romans continued to be used by the nations formed on the ruins of their empire, such alterations only being made in the internal arrangements of the camp as were rendered necessary by differences in the numerical strength of the principal divisions of the troops.

The camps of the ancient Britons, and those of the Anglo-Saxons and Danes in this country, seem to have been intrenched by breast-works made of felled trees, or of earth and stones rudely heaped together. Concerning the disposition of the troops within the inclosure, we only know that the Saxons drew up their cavalry in one dense body surrounding the standard, and that they placed the foot soldiers with their heavy battle-axes in front. In a description of the camp formed by Edward II. during his expedition to Scotland in 1307 is contained the first hint we have of any regularity in the distribution of an English army while in the field; this amounts however to little more than that the ground was marked out, and that to every one his proportion of the space was assigned. Within the camp tents of white or coloured linen were set up, and huts were constructed, the latter probably for the private soldiers. (*Grose, Mil. Antiq.*, vol. ii., p. 205.)

Anciently, both the English and French commanders of armies appear to have fortified their encampments when they undertook the siege of any place, particularly if it appeared likely to be of long duration; and P. Daniel states, that when cannon was used, it was placed for the protection of the army in large redoubts of wood or earth, called *Bastilles*, constructed at intervals along the circumvallation. The same author relates that the English, while they made war in France, went by parties into the country, carrying with them strong palisades to form an intrenchment, behind which they were protected while using their crossbows. (*Hist. de la Milice Françoise*, liv. vii., ch. 2.)

In the modern system of war, from the necessity of avoiding, as much as possible, the destructive effects of the enemy's artillery, and the desire of affording all possible development to the fire of their own infantry, commanders of armies have been compelled to abandon the square form of the ancient encampments, and to adopt that of long and narrow lines. But with this arrangement it seldom happens that the ground will permit a perfect regularity in the dispositions of the several battalions and squadrons; and the occurrence of streams or other accidents of the country may break the continuity of the line, or may render it necessary to give it a bent or waving direction. When however an army is encamped under tents, it may be regarded as a general rule that the line should correspond to that in which the troops are to be drawn up to engage the enemy; also that the tents of each battalion should not occupy a greater space in front than the battalion itself would cover when in order of battle,—a practice which is said to have originated with Gustavus Adolphus.

The length of the front of a battalion of 750 men, two deep, allowing 21 inches to each file, will be 219 yards; and this would be the extent of the line of tents, were it not that the line is regulated by the probable number of effectives, instead of the numerical strength of the establishment. The depth of the encampment for a battalion is of less importance; but, when the ground will permit, it may be regulated by the following disposition, which is considered as affording sufficient convenience.

The tents of the privates may be ranged in two lines parallel to the front, with an interval of about 12 feet as a street between every two companies in each line, and those of the captains and subalterns may be in one line in the rear of these; the field-officers and the commanding officer may occupy a fourth line; the staff a fifth; and the line of kitchens may be in the rear of all. By this arrangement the depth, including a space for the sutler's tent, the bat-men and horses, will be about 50 yards; but an interval of 16 yards should separate the front of the men's tents from the line of parade, which is parallel to that front. Opposite the centre of the battalion, and about 60 yards in front of the line of parade, are the tents of the party which forms what is called the quarter-guard; and at about 15 yards in rear of the kitchens the party forming the rear-guard is situated. Including all these intervals, the depth of the encampment for infantry will be 150 yards.

The length of front for a complete regiment of cavalry, consisting of eight troops, when formed two deep, is about 320 yards; and this may be considered as the extent occupied by the regiment in the line of the encampment. The seven tents of each troop are ranged in a line perpendicular to the front, and the horses are attached to pickets in lines parallel to those of the tents; the remainder of the space, reckoned parallel to the front, being occupied by the breadths of the streets. In rear of the men's tents and parallel to the front are arranged the subalterns' horses in one line, the tents of the captains and subalterns in another; those of the field-officers and commanding officer in a third, and the kitchens in the rear of all. The standards are placed parallel to the front at 10 yards before the tents of the privates, and the distance from thence to the line of parade is 30 yards: with these dispositions the whole depth of a regiment of cavalry will be 216 yards.

A large army is encamped in two lines which, if the ground will permit it, are parallel to, and at the distance of about 300 yards from each other; and a reserve, generally consisting of the best troops, is formed in rear of the second. The stations of the cavalry are on the flanks of each line. The artillery attached to an army is formed into brigades, and is posted either on the flanks of the camp or with the reserve in the rear; the extent of front, for a heavy brigade, is 69 yards, and the depth, including the line of guns, of limbers, and three lines of waggons, is 92 yards.

The circular tents at present in use are 13 feet 3 inches diameter within the walls (the canvas which hangs vertically between the conical part of the tent and the ground). Of the cavalry 12 men, and of the infantry 12 men, are appointed to each tent.

From a document which is supposed to be of the time of Elizabeth it appears that then an English camp was divided into six portions, of which three were assigned to the cavalry and three to the foot soldiers; and that between every division was a street 80 feet wide. There was also a space allotted for the market, and within this was the park of artillery, surrounded by carriages. It was regulated that no man should pitch his tent within 140 feet of the ring, or periphery of the camp.

The soldiers' huts or tents were placed six deep; each was eight feet square, and contained two men; the depth of the encampment, including the depths, the officers' tents, and the cross streets, was 300 feet; and, including the streets, the whole extent in front of a regiment consisting of 13 companies, each of 150 men, was 712 feet. Originally, it seems, the officers' tents were placed in front of those occupied by the men; but Sir James Turner states that Henry of Nassau changed that custom, and caused them to be placed in the rear, as they are at present, in order that the soldiers might be enabled to have more easy access to the parade in front of the line. (Grose, ii., pp. 213, 214.)

The great extent of the space which, for the reasons before mentioned, is unavoidably occupied by an army in the field, renders it, in most cases, impossible to fortify the site of the encampment by a continuous line of parapet like that with which the Roman armies surrounded themselves on taking up a defensive position; and the security of a modern army against surprises is now obtained principally by the situation being difficult of access, from streams, marshes, or inequalities of the ground, and by keeping numerous advanced posts to watch all the approaches by which an enemy might arrive at the camp.

There are, however, some circumstances which render it indispensable that an encampment should be strengthened by fortifications; as when the troops are inexperienced or the army is deficient in cavalry; but chiefly when a position is occupied which it is of the utmost importance to hold, because the possession of it would be advantageous to the enemy. The latter may then be reduced to the alternative of attacking the encampment at a disadvantage, or of suffering a loss of valuable time in making the movements necessary to turn it. In these cases, every resource of the engineer in the construction of works and in obstructing the approaches should be put in practice for the purpose of augmenting the resistance which the army may be capable of making.

A continuous line of works may therefore be admissible for an army inferior to that of the enemy, provided the extent of the line be not so great as to prevent the intrenchments from being sufficiently manned in every part; but a camp so fortified would possess no advantages for an army which is strong enough to assume the offensive on a favourable occasion presenting itself; and it is evident that, in this case, it would be sufficient to construct merely a few redoubts in situations from whence a fire of artillery might be directed for the purpose of defending the approaches, while the disposable force of the army might be kept in masses ready, at a proper time, to make a movement to the front through the intervals between the works.

This principle does not, till lately, appear to have been well understood; and the cautious spirit with which a campaign was conducted during the eighteenth century contrasts strongly with the bold measures generally pursued in the late war. Marshal Daun, though always superior in number to the Prussians, intrenched himself with the utmost anxiety; and in 1759, when he took up a position near Dresden, though the king of Prussia had lost the battle of Kunersdorf, and the Austrian army was encamped upon steep rocks, covered by a stream difficult to pass, yet the marshal surrounded himself with works so numerous, that even the smallest paths were protected by them, and so strong, that twenty years afterwards they were in existence. But one of the most celebrated of these intrenched camps was that which, in 1761, the king of Prussia took up at Buntzelwitz in order to cover Breslau. This camp was formed within a chain of hills protected on three sides by streams: six salient points on the contour were fortified by bastions, the fires from which would have flanked the intermediate parts of the line, and these were further protected by *flèches* constituting a sort of broken curtain between every two redoubts. Nearly 180 pieces of artillery were planted to defend the avenues, and the camp was surrounded by abatis and other obstacles by which the approach of an enemy might be impeded. (Jomini, *Traité des Grandes Operations Militaires*, tom. iv.) Such intrenchments however avail nothing when the army is not commanded by a man of great military genius. The French camp at Malpaquet, in 1709, is stated to have been fortified with a triple line, consisting of breastworks, hedges, and felled trees; it was forced however, though with great loss, by the allies under the duke of Marlborough.

It is remarkable that, during the war in Spain, which in general was distinguished by inattention to the means of strengthening the positions occupied by the troops, one of the finest examples of an intrenched camp was afforded in that which the British army occupied before Lisbon in 1810. This consisted of a double line of detached redoubts constructed on all the commanding points of ground, for the purpose of defending the four great roads and the accessible passes by which the enemy could approach to that city. The first line began at the mouth of the Zizandra on the Atlantic; it crowned the heights above Torres Vedras, and, following the chain of Monte Graça, extended to the Tagus at Alhandra, its whole length being about 29 miles. The second was about six miles in rear of the first; it began at the mouth of the S. Lorenzo, on the ocean, passed over the heights at Mafra, Montechique, and Bucellas, and reached the Tagus at Quintella, its whole extent, in length, being about 24 miles. The weakest part seems to have been the valley of Calhandria, near the Tagus, on the exterior line; but this part was afterwards strengthened by a double row of abatis, besides breast-works of earth and thick stone walls. When the lines were completed, they consisted of 152 redoubts, armed, in all, with 534 pieces of ordnance, and required above 34,000 men for their garrisons. The disbursements for their construction amounted to nearly 100,000*l*. (Colonel Jones, *Memoranda on the Lines of Lisbon*, p. 107.) [LINES OF INTRENCHMENT, MILITARY POSITIONS.]

ENCAUSTIC PAINTING (ἐγκαυστική, encaustike), a kind of painting in which by heating or burning in (as the Greek term implies), the colours were rendered permanent in all their original splendour. It was not however enamelling, as some have imagined, but a mode of painting with heated or burnt wax, which was practised by the antients, various specimens of which have been preserved in the East, and which, according to some historical statements, was in use at Venice even to the time of Titian. Pliny, in his 'Natural History' (xxxv. 11), gives a short account of the invention and nature of this art. He says, 'Ceris pingere ac picturam inurere, quis primus excogitaverit non constat.' But though he expressly says wax, some persons have imagined that by *ceris* he here means some composition different from wax, and capable of bearing the fire, and that *inurere* means to enamel. In the same chapter he says that there were antiently two modes of encaustic painting, 'cera et in ebore, cestro, i.e. viriculo. Hoc tertium accessit, resolutis igni ceris, penicillo utendi.' The Marchese Haus, in accordance with Pliny, assumes three kinds of encaustic painting, distinguishing as an essential point, whether the cestrum (a style, or a graving tool) or the pencil was employed in the execution. In the first mode, the wax was melted, mixed with as much [illegible] colour finely powdered, as it could imbibe, and then the mass spread on wood, or on a wall with a hot spatula. When it became cold, it was the ground, in which the designer cut the lines with a cold pointed tool (style, cestrum), and thus, properly speaking, it was not the painting but the wax ground that was burnt in, and the name encaustic was improperly given to the painting. With regard to the second kind, encaustic painting on ivory, the most erroneous notions were long entertained. Professor Grund, of Florence, who has devoted much attention to encaustic painting, seems to be nearest to the truth. When the practice of drawing on hard wax had been brought to a degree of perfection, they proceeded to apply it on a small scale to ivory, which was at that time in the highest estimation. Ivory tablets were therefore covered with red or black wax, and the design cut in it with the style, the object being to use the clear and smooth surface of the ivory for the lines, that they might look the more beautiful. This therefore was nothing more than applying to ivory what had previously been done on wood, or wax. The third kind is the applying the colours with the pencil. With respect to the manner in which this was executed, opinions differ. The most correct notion seems to be that the wax was dissolved, the colours mixed with it, and laid on with the pencil, and the painting then finished by careful approximation to the fire, whence this kind of painting became properly encaustic. For this purpose a hot iron (cauterium) was used. When painting had been greatly improved by the invention of the pencil, a new method of encaustic was attempted. Encaustic wax painting had hitherto been designing on a coloured ground; it now became painting with wax colours burnt in. When the artist had laid on the wax ground, and traced the outlines with the style, he proceeded to the colouring. From the wax mixed with the colours he separated with the hot style as much as he wanted to cover a certain space, and spread it over the ground, put a second, third, &c., colour next the first, so that he had local tint, half tint, and shade together, which he softened into each other with the hot style. After the whole art of encaustic painting had long been lost, the memory of it was recovered by Count Caylus, in France, who announced to the Academy of Painting the method of painting in wax in 1752: a Mr. Bachelier however had actually painted a picture in wax in 1749, and is the author of a treatise on the art and secret of wax painting; and he was the first who communicated to the public the method of performing the operation of inustion, which chiefly characterizes encaustic painting.* The count kept his method secret for a time, and in 1754 exhibited at the Louvre a head of Minerva painted in the manner of the antients. This was much admired, and it was affirmed that in wax painting the colours were more permanent, purer, and brighter than in oil painting. Several other persons have made essays in this art, as Bien, Bertscher, Bar. Taube in Mannheim, W. Kalan, painter in Berlin, and Reifenstein. As neither Pliny, nor Vitruvius, nor any other antient author, has left a clear account of the methods employed, it may be reasonably doubted whether any one among the various processes employed or recommended by the moderns is the same as those of the Greeks. J. G. Walter, in Berlin, and Professor J. Roux, in Heidelberg, have recently turned their attention to wax painting; the latter is said to have left many very successfully executed wax paintings; but he did not publish his secret, though he strongly recommended it to painters in his treatise on colours (Die Farben, Heidelberg, 1828). Since 1826 Mr. Peter Kraft, at Vienna, has painted several paintings on walls, in which however only the warmed ground was covered with wax, and the colours mixed with oil of turpentine laid on it. The process made known by Montabert in his 'Traité de la Peinture,' vols. vii. and viii., has a greater resemblance to encaustic painting, properly so called. The laying on is nearly in the manner last mentioned, but a wax varnish is spread over the colours, and melted in by means of a kind of brasier. A series of paintings has been executed, according to his direction, on the walls of the royal palace at Munich, since 1831; but even here all the difficulties with respect to the durability of the ground and the colours have not been overcome.

ENCKE'S COMET, one of the periodic comets which have been ascertained to belong to the solar system, revolving round the sun in about 1200 days, within the orbit of Jupiter.

A full account of this body is contained in a memoir by Encke, published in numbers 210 and 211 of the *Astronomische Nachrichten*, and translated by Mr. Airy, under the title 'Encke's Dissertation,' &c., Cambridge, 1832. See also the 'Reports of the British Association,' vol. i. (1831-1832), and the tract of M. Arago 'Des Comètes en général,' in the 'Annuaire' of 1832.

This comet is now known to have been seen in 1786 by Méchain and Messier, in 1795 by Miss Herschel, and in 1805 by M. Pons of Marseilles, and others. But the train of investigation which established it as a *periodic* comet (all the preceding observations having been supposed to be of different bodies) dates from the observations of M. Pons in 1818-19. A comet having been then discovered by him, and its elements determined, Encke (from whom the comet has its name) immediately showed that it was the body which had been seen in 1805. Olbers detected it to be the comet of 1795; and Encke (Berlin Ephemeris, 1822 and 1823) having established the fact that its revolution was completed in about 1200 days, predicted approximately the part of the heavens in which it would reappear in 1822. The prediction was verified by the observations of M. Rumker at Paramatta, since which time it has regularly taken its place as one of the bodies of the solar system.

Upon the question which has been raised relative to the gradual approach of this comet to the sun, and the consequent presumption of the existence of a resisting medium, see COMET. The memoir of M. Encke (translated by Mr. Airy, as cited) enters fully into the discussion of this question.

The elements of this body, adopted by M. Encke for its reappearance in 1832, are as follows:—

Passage through perihelion, 1832, May 3·99.
Longitude of perihelion, 157° 21′.
Longitude of ascending node, 334° 32
Inclination, 13° 22′.
Angle of eccentricity, 57° 43′.
Mean daily sidereal motion, 1071″·1.
Perihelion distance, ·3435 } Earth's mean distance from
Aphelion distance, 4·101 } sun being unity.
Periodic time, 1210 days.

ENCRINITES, the name by which the petrified radiated animals commonly called *Stone Lilies* have been long known in Britain; it is frequently applied to the *Crinoidea* generally, both recent and fossil.

Lamarck arranged the genus *Encrinus* in his fifth order of Polypes (*Polypi natantes*), fixing its position between *Virgularia* and *Umbellularia*, and recording but two species, one recent, viz. *Encrinus Caput Medusæ* (*Isis Asteria Linn.*), from the seas of the Antilles, the other fossil, viz., *Encrinus liliiformis*, *Lilium lapideum* (Stone Lily) of Ellis and others.

Cuvier included the encrinites among his pedicillated echinoderms, considering that they should be placed near the *Comatulæ;* and, in the Règne Animal, they are, accordingly to be found between the great group of the *Starfishes* and that of the *Echinidans*.

De Blainville observes that the beautiful work of Guettard (Acad. des Sc. 1755) upon the living and fossil encrinites showed long ago the great relationship which there is between these and the stellerideans, now known under the name of *Comatulæ*, and he remarks upon the arrangement of Lamarck, who followed Linnæus and his adherents in placing them among the zoophytes, notwithstanding Guettard's exposition and Ellis's confirmation. After alluding to Miller's work on the family, and to Mr. Thompson's description of the living specimen found on the coast of Ireland, De Blainville takes as the basis of his terminology the parts which exist in *Comatula*, and adopting the views of Rosinus, rejects that proposed by Miller in his interesting memoir, objecting to the terms *pelvis*, *costal*, *intercostal scapula*, *hand*, *fingers*, &c., as derived from animals of an entirely different type of form and inapplicable to the radiated structure.

We find, then, that the *pelvis* of Miller is the *centro-dorsal joint* (*l'article centro-dorsal*) of De Blainville. The *costal* is the first *basilary joint* of each ray. The *intercostal* is the second *basilary joint*. The *scapula* is the third, or that on which the radii are supported. The *hand* is the part of the ray which is divided but not separated. The *fingers* are the *digitations* or divisions of the rays. Finally, the *pinnules* are the lateral divisons of the digitations; and De Blainville, like Miller, divides the *rays* into *principal rays* and *accessory* or *auxiliary rays*.*

Habits, &c. Dr. Buckland (Bridgewater Treatise), who uses the phraseology of Miller, speaks of these animals as destined to find their nourishment by spreading their nets and moving their bodies through a limited space, from a fixed position at the bottom of the sea; or by employing the same instruments, either when floating singly through the water, or attached like *Pentelasmis* (CIRRIPEDA) to floating pieces of wood. He refers to Miller for several instances of their power of repairing casual injuries, and figures a recent *Pentacrinus*, one of whose arms is under the process of being reproduced, as crabs and lobsters reproduce their lost claws and legs, and many lizards their tails and feet, observing that the arms of starfishes also, when broken off, are in the same manner reproduced. The same author remarks, that although the representatives of the crinoïdeans in our modern seas are of rare occurrence, this family was of vast numerical importance among the earliest inhabitants of the antient deep. 'We may judge,' say Dr. Buckland, 'of the degree to which the individuals of these species multiplied among the first inhabitants of the sea, from the countless myriads of their petrified remains which fill so many limestone-beds of the transition formations, and compose vast strata of entrochal marble, extending over large tracts of country in Northern Europe and North America. The substance of this marble is often almost as entirely made up of the petrified bones of encrinites as a corn-rick is composed of straws. Man applies it to construct his palace and adorn his sepulchre, but there are few who know, and fewer still who duly appreciate, the surprising fact, that much of this marble is composed of the skeletons of millions of organized beings, once endowed with life, and susceptible of enjoyment, which, after performing the part that was for a while assigned to them in living nature, have contributed their remains towards the composition of the mountain masses of the earth. Of more than thirty species of crinoïdeans that prevailed to such enormous extent in the transition period, nearly all became extinct before the deposition of the lias, and only one presents the angular column of the pentacrinite: with this one exception, pentangular columns first began to abound among the crinoïdeans at the commencement of the lias, and have from thence extended onwards into our present seas. Their several species and even genera are also limited in their extent; e. g. the great lily encrinite (*E. moniliformis*) is peculiar to the muschel-kalk, and the pear encrinite to the middle region of the oolitic formation.'

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* It is necessary to put the student on his guard against the confusion and error manifest in this part of M. de Blainville's useful work. This was not a little puzzling when considered as coming from a pen of such high reputation as his; till the arrival of the 'Nouvelles additions et corrections' brought the information that 'par une transposition singulière du manuscrit, il y a eu une sorte de mélange entre les paragraphes qui appartiennent aux genres *Encrinus* et *Pentacrinus*.' In short, among other mistakes, the titles *Encrinus* and *Pentacrinus*, together with whole paragraphs, have been misplaced.

The same author, speaking of the joints which composed the stem, says, 'the name of Entrochi, or wheelstones, has with much propriety been applied to these insulated vertebræ. The perforations in the centre of these joints affording a facility for stringing them as beads, has caused them in antient times to be used as rosaries. In the northern parts of England they still retain the appellation of St. Cuthbert's beads.

On a rock by Lindisfarn
Saint Cuthbert sits, and toils to frame
The sea-born beads that bear his name.

'Each of these presents a similar series of articulations, varying as we ascend upwards through the body of the animal, every joint being exactly adjusted to give the requisite amount of flexibility and strength. From one extremity of the vertebral column to the other, and throughout the hands and fingers, the surface of each bone articulates with that adjacent to it, with the most perfect regularity and nicety of adjustment. So exact and methodical is this arrangement, even to the extremity of its minutest tentacula, that it is just as improbable that the metals which compose the wheels of a chronometer should for themselves have calculated and arranged the form and number of the teeth of each respective wheel, and that these wheels should have placed themselves in the precise position fitted to attain the end resulting from the combined action of them all, as for the successive hundreds and thousands of little bones that compose an Encrinite to have arranged themselves in a position subordinate to the end produced by the combined effect of their united mechanism, each acting its peculiar part in harmonious subordination to the rest; and all conjointly producing a result which no single series of them acting separately could possibly have effected.' (*Bridgewater Treatise.*)

De Blainville characterizes his Fixed Asterencrinideans (*Astérencrinides fixés*) as having a *body* more or less bursiform, supported upon a long articulated stem, and fixed by a radiciform part.

Genera. Apiocrinites.

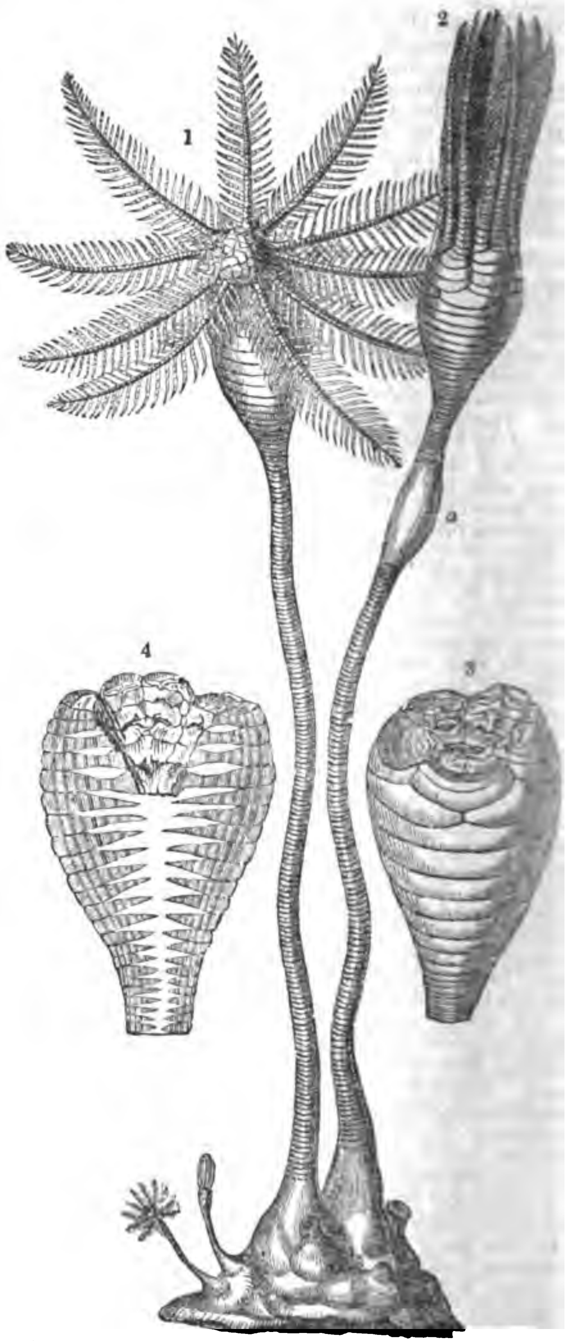
Miller, who established this genus, characterizes it as an animal with a column gradually enlarging at the apex, composed of numerous joints, of which the superior is marked by five diverging ridges, dividing the surface into as many equal portions, sustaining the pelvis, formed of five sub-cuneiform joints, supporting others of a figure nearly similar, from which proceed the arms and tentaculated fingers formed of simple joints having the figure of a horse-shoe.

De Blainville thus defines it. *Body* regular, circular, for the rest unknown, contained in a sort of cupule or conical test (têt), composed of three superposed rows, each consisting of five scaphöid plates, united or joined throughout, the upper one supporting on a radiated surface the rays which are formed by a simple series of non-pinnated (?) articulations. *Stem* round, at first as large as the body, attenuating by degrees down to the root; articulations circular, little elevated, pierced by a round hole, and radiated at their surface. Auxiliary rays scattered.

Geological Distribution.—The genus has occurred hitherto in a fossil state only, and has only been found in strata posterior to the lias. Example, *Apiocrinites rotundus*. Round-columned, Pear-like, Lily-shaped animal (?).

Description.—This appears to be the *Astropoda elegans* (stem) of Defrance. It is the *Bradford Pear Encrinite* of Parkinson, and is described by Miller as a *Crinoidal animal*, with a *round column*, composed of joints adhering by radiating surfaces, of which from ten to fourteen gradually enlarge at its apex, sustaining the pelvis, costæ, and scapulæ, from which the arms and tentaculated fingers proceed. *Base* formed by exuding calcareous matter, which indurates in laminæ, and permanently attaches the animal to extraneous bodies.

Locality.—(Oolite, middle region.) Bradford in Wiltshire, Abbotsbury, near Weymouth, Dorsetshire, Soissons, Rochelle, &c



Apiocrinites rotundus restored and reduced: 1, expanded; 2, closed [illegible] the remedial effect of calcareous secretions in repairing an injury [illegible] joints of the stem: two young individuals, and the surfaces of two [illegible] stems appear at the base; 3, pear-shaped body of Apiocrinites [illegible] showing at its upper extremity the internal disposition of the bones surrounding the cavity of the stomach; 4, vertical section of the body, [illegible] the cavity of the stomach, and a series of lower cavities, or hollow [illegible] spaces, between the central portions of the enlarged joints of the upper [illegible] of the vertebral column. These spaces are considered by Miller as [illegible]ments of the alimentary canal, which descends through the axis of the [illegible] column. The surfaces of the joints of the vertebral column are [illegible] rays on the adjacent plates, and allow of flexure without risk of dislocation. (Dr. Buckland, *Bridgewater Treatise.*)

It will be observed, that De Blainville speaks of the rays as being formed of a simple series of articulations without pinnæ: he adds, it is true, a note of interrogation. Miller in his restoration has made the rays pinnated; and Dr. Buckland, from whose work the cuts above given are by permission taken, has continued Miller's restoration: nor do we see any reason for objecting to the views of the last-named authors. The absence of pinnæ on the rays would make the apparatus a very imperfect organ of capture; but the presence of these appendages produces at once the net-like structure observable in many others of the family, so admirably adapted for taking and securing the prey which might come within the sphere of the Encrinite's action.*

Miller describes and figures a second species, *Apiocrinites ellipticus* (*Bottle Encrinite*, *Stroud Encrinite*, and *Sting-Horn Encrinite* of Parkinson; Goldfuss refers to it as *A. elongatus*), and gives the chalk-pits of Wiltshire and Kent as its localities. The bodies, &c., of this species are the *Chalk Bottles* of the quarrymen.

M. Goldfuss, in his great work, records four additional species, viz. *A. rosaceus*, *A. mespiliformis*, and *A. Milleri* (Schlotheim), and *A. flexuosus*, and *A. obconicus* (Goldfuss), retaining Miller's *A. ellipticus*, and referring to Miller's description of that species for *A. elongatus* also.

Encrinus. (Encrinites. True Lily-shaped animal of Miller.)

Miller characterises his genus *Encrinites* as a crinoidal animal, with a column formed of numerous round depressed joints, adhering by a radiating grooved surface, and becoming subpentangular near the pelvis, which is composed of five pieces, giving a lateral insertion to the first series of costal plates, to which the second series and scapulæ succeed, whence the tentaculated arms or fingers proceed, formed by double series of joints. He observes, that the animals of this genus have not hitherto been found in a living state, nor does he believe that their remains have been discovered in England. Only one species known, viz. *Encrinites liliiformis* of Lamarck.

Description, &c.—This is the *Encrinites moniliformis*, *Bead-columned, True Lily-shaped animal* of Miller, who describes the species as a crinoidal animal, with a column formed of numerous round joints, alternately, as they approach the pelvis, larger and smaller, becoming subpentangular when nearly in contact with it. On the pelvis, formed of five pieces, adhere laterally the first series of costæ, on which the second series of costæ is placed, succeeded by the scapulæ, from which the ten tentaculated arms or fingers proceed. Animal permanently affixed by extended indurated matter.

We consider this *Encrinites moniliformis* as the *Encrinus liliiformis* of Lamarck, the *Encrine*, and *Lys de Mer*, of the French, the *Lilium lapideum* of some of the older authors, and the *Stone Lily* of the English. Locality, (Muschelkalk.) Hildesheim, Rakenberg, near Goslar, Obern-[illegible] and [illegible], not far from [illegible], in Lower Saxony; [illegible] in Juliers, in Westphalia; the village of Erkerode, in Brunswick, about two miles from the town bearing this name, near a wood called the Elm, &c. In this last-named locality the quarry is on the declivity of a hill overgrown with wood, on which account the inhabitants oppose the digging after them. The stratum containing them is hardly fifteen to eighteen inches in thickness. Under the surface of the earth is a friable, porous, argillaceous limestone, containing millions of columns and columnar joints; but many hours' digging is necessary before a good specimen of the superior part, or stone-lily, can be procured, since the moisture in the stone contributes to their rapid destruction, and their occurring on large pieces of stone makes them liable to separation, which accounts for the many mended specimens. Another and harder stratum under the above contains numerous crinoidal remains; but, according to the quarrymen, no stone lilies. (Miller.) The author last quoted adds that there is good reason to believe that the formation in which the remains are found near Brunswick corresponds with the white lias of England, as it appears to repose on the newer red sandstone, containing salt and gypsum.

Fine specimens of this fossil have always been and still are sought for with great eagerness by collectors. In the 'Beyträge zur Naturgeschichte,' Altenburg, 1774, it is stated that the emperor of Germany offered one hundred dollars for a stone lily free from the matrix, and attached to its column.

'The peculiarly fine lily encrinite,' writes Miller, 'figured by Knorr, tab. 11 *a*, was, it is said, purchased (Naturforscher, Stück 3) from the labourers at the limestone quarry at Schraplau, near Halle, by Inspector Wilkens, for thirty-two groschen, and given to Professor Lange, who sold it to baron Niegert. However in the same publication (Stück 6), it is stated that it was not bought by Wilkens, but by Mr. Vingt at Farrenstadt, near Querfurt, for two dollars, and given to Lange, who sold it for three louis d'or. If my memory does not misgive me, I think I saw the specimen about twenty years ago in the collection of the Naturforschenden Gesellschaft, at Danzig. Where is it now?'

Encrinus liliiformis.

Pentacrinus. (Pentacrinites vel Pentacrinus. Five-angled Lily-shaped Animal. Miller. Pentagonites Rafinesque.)

The following is Miller's *Generic character*. An animal with a column formed of numerous pentangular joints, articulating by surfaces with pentapetalous [illegible] markings. Superior columnar joint supporting a pelvis of five joints, on which five first costals rest, succeeded by five second costals and five scapulæ, from which ten arms proceed, having each two hands, composed of several tentaculated fingers. *Column* long, having numerous auxiliary side-arms. *Base* not ascertained.

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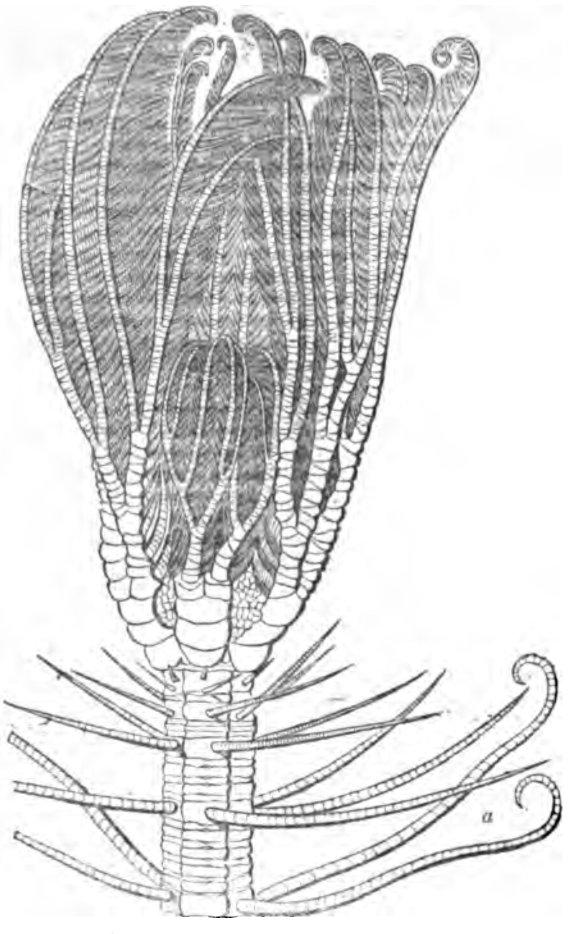
* Since the above was written, we find that M. de Blainville has corrected himself, for, in the 'Nouvelles Additions et Corrections,' he says, speaking of Encrinites, 'on the [illegible] instead of three, read five;' and adds, 'rays [illegible] and composed of closely jointed articulations.'

Recent species.

Pentacrinus Caput Medusæ. Description. A crinoidal animal having a column formed of numerous pentangular joints, articulating by surfaces with pentapetalous, ovate, striated markings; five auxiliary side-arms formed of round joints proceeding from the column at intervals. Superior columnar joints supporting a pelvis of five plates, to which the first costals, second costals, and scapulæ, succeed, from which ten arms proceed, each supporting two hands, subdividing into three fingers. Lower extremity, or base, unknown. (Miller.)

This is the *Encrinus Caput Medusæ* of Lamarck, *Isis Asteria* of Linnæus. Locality, the seas of the Antilles. Near the island of Barbadoes (Dr. Hunter's specimen)—that of Nevis (specimen formerly belonging to James Tobin, Esq., now in the British Museum)—and Martinique (specimen in the Paris Museum). There is also a specimen in the Museum of the Royal College of Surgeons in London, and one in that of the Geological Society of London.



Pentacrinus Caput Medusæ. In the front of the figure two of the arms are much smaller than the others, showing that the animal had suffered mutilation, and had employed its power of reproducing the lost parts. *a*. The auxiliary side-arms, articulating at distant intervals with the vertebral column, capable also of being reproduced. (Miller and Buckland.)

Mr. Miller, in speaking of Mr. Tobin's specimen, says, 'In the drawing it up from the bottom of the sea, the animal has clearly been broken off, leaving its posterior portion behind; thus we have lost the chance of ascertaining the fact, whether it adhered by a fixed base, or had a locomotive power. The same accident has befallen the other recent individuals that have been mentioned when speaking of the locality of this species. However, judging from its analogy to the *Encrinus moniliformis*, from its long column, numerous auxiliary side-arms, and the associated manner in which groups of the following species are sometimes found preserved on the surface of a single slab, with the columns all tending towards the same point, as if issuing from a common base, I conceive that this species also adhered by a base to extraneous matter. This idea gains some further ground, from all the recent specimens hitherto found having broken abruptly off in the endeavour to remove them, as not being able to free themselves from the points of adhesion, which certainly would have been the case had the animal possessed a locomotive power.' This inference acquires additional confirmation from the observations made by the late J. Tobin, Esq., on another specimen, viz.—'Some years ago I was in possession of a large Pentacrinite, which was brought to me so fresh out of the sea that at the bottom (where it plainly appeared to have been broken off from the rock to which it was fixed) the blood was actually oozing from the vertebræ. This specimen I endeavoured to preserve, but it was totally destroyed by the ants, who ate every cartilage, so that it fell to pieces.' Miller observes upon this, that the 'blood' was the fluid of the alimentary canal, and refusing to admit the assertion of Walch, that the Pentacrinite is an animal crawling at the bottom of the sea, conceives it to have generally stood more or less erect in the sea, yielding to the fury of the storm in bending down, and adhering for additional security with its side-arms to extraneous matter, or closing them to the column, and thus offering the least surface possible to the element. The latter, he thinks, is the most probable idea, since he had frequently met with specimens in that state, but had never seen any side-arms clasping round extraneous matter. The author elsewhere states that he has in vain endeavoured to trace apertures at the terminating points of the fingers and tentacula, although Guettard alleges that here orifices existed serving as mouths to the animal in taking its food.

Miller observes that columnar fragments, smaller and rather neater than those of this species, occur in the oolite at Dundry, the forest marble at Chippenham, and the chalk near Lyme, but that it remains to be ascertained, by the acquisition of perfect specimens, whether these belong to a variety of *P. Caput Medusæ*, or possess peculiar characters sufficient to distinguish them as a new species.

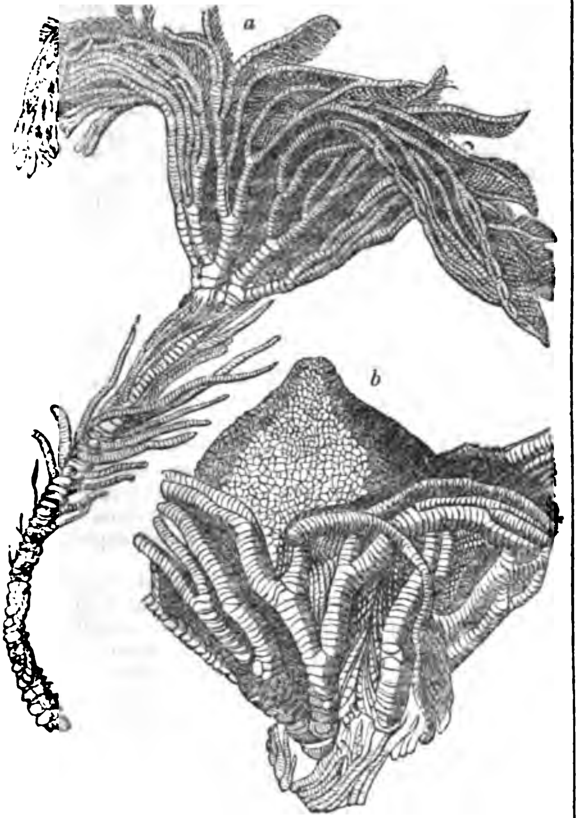
FOSSIL SPECIES.

We select, as an example, the Briarean Pentacrinite, *Pentacrinus Briareus*, thus characterized by Miller. 'A crinoidal animal, having a large column formed of numerous pentagonal joints, alternately larger and smaller, articulating by surfaces with pentapetalous compressed semi-striated markings; five auxiliary arms, formed of much compressed suboval joints, proceeding at intervals from the column; five joints of the pelvis, supporting five first and five second costal joints, on which the scapulæ affix, from which ten arms proceed, each having two hands, formed of numerous fingers, sometimes amounting to sixteen.'

Dr. Buckland observes that the root of the Briarean Pentacrinite was probably slight, and capable of being withdrawn from its attachment. The absence of any large solid secretions like those of the Pear Encrinite, by which this Pentacrinite could have been fixed permanently at the bottom, and the further fact of its being frequently found in contact with masses of drifted wood converted into jet, leads him to infer that the Briarean Pentacrinite was a locomotive animal, having the power of attaching itself temporarily either to extraneous floating bodies or to rocks at the bottom of the sea, either by its side-arms or by a moveable articulated small root. We confess that we cannot entirely concur with the professor on this point. That in early youth the animal may have floated till it found a substance fit for it to adhere to, we do not deny; but we think that after it was once established and had attained a good size, it was fixed for ever. The great length of the stem and the numerous side-arms must have secured for it a field of action beyond that of the Pear Encrinite and the Lily Encrinite, both of which we know had permanent roots; and if we are to judge by analogy, there is pregnant evidence that the specimens of the living species, more especially the larger one mentioned by Mr. Tobin, who saw it quite fresh out of the sea, and to whose expressions above given we refer the reader, suffered their stems to be torn asunder without quitting their moorings.

Locality.—Lower strata of the oolite formation, especially the Lias: Lyme, Watchet, Keynsham, &c.

Mr. Miller gives three other fossil species, viz., *P. subangularis*, *P. basaltiformis*, and *P. tuberculatus*. Goldfuss has recorded the following additional species, viz., *P. scalaris* (Goldfuss), *P. cingulatus* (Münster), *P. pentagonalis* (Goldfuss), *P. moniliformis* (Münster), *P. subsulcatus* (Münster), *P. subteres* (Münster), *P. dubius* (Goldfuss), and *P. priscus* (Goldfuss), and, with a note of interrogation, Pentacrinus? *paradoxus*.

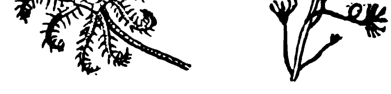


a, Pentacrinus Briareus reduced (Lyme); b, rare and beautiful specimen of Briarean Pentacrinite (nat. size), from the lias at Lyme Regis, in the collection of Mr. Johnson, of Bristol, showing the plated integument of the abdominal cavity, terminated upwards by a flexible proboscis, and surrounded by the commencement of the arms and fingers. (Figures and description from Dr. Buckland's 'Bridgewater Treatise.')

Phytocrinus.

(**De Blainville**;—**Hibernula, Fleming; Pentacrinus, Thompson.**)

Generic Character.—Body regular, circular, covered and surrounded above by a sort of solid cupule, composed of a centro-dorsal undivided piece, round which are articulated, first, a single row of accessory unguiculated rays, then another row of great didymous and pinnated rays on the other side of three basilary joints, of which the first only partially touch each other. *Stem* articulated, round, and without accessory rays. *Mouth* central in the midst of five scales, which are foliaceous and bordered by a row of tentacular cirrhi; a large tubular orifice a little behind the mouth. **Example**, *Phytocrinus Europæus, Pentacrinus Europæus*, Thompson.



Pentacrinus Europæus of Thompson.

a, Several individuals in different stages of development adhering by the base of an articulated column to the stem of a coralline; b, one of the individuals expanded and magnified.

M. de Blainville states that he has thus characterized this genus, which he had not seen, from the excellent description and figure of Mr. Thompson; and that it seems to M. de Blainville that there are sufficient differences to warrant the generic distinction of the animal. He observes that in *Phytocrinus* the stem is round, perhaps even inarticulate and flexible; that there are no accessory rays except at the summit; and, besides, that the great rays are all otherwise conformed in their basilary as well as in their pinnated part. It may be supposed, he adds, that the membranous part of the body differs equally both in the disposition of the mouth and in that of the visceral pouch; but of this there is no assurance, that part not being known in the great living Pentacrinite. He remarks that Dr. Fleming, admitting the doubt of Mr. Gray as to the existence of the visceral pouch in this last, has also characterized the European Pentacrinus under the name of *Hybernula*, a name which he allows may be adopted, though he gives the preference to his own as being more analogous to those invented by Mr. Miller for the Crinoideans. M. de Blainville goes on to declare that he has already had occasion to say that Mr. Thompson's memoir has destroyed all doubt as to the place of the living and fossil Encrinites, and has clearly demonstrated the justice of the views of Rosinus, adopted by Guettard, Ellis, Parkinson, and Cuvier, in opposition to that of Linnæus followed by Lamarck. 'An *Encrinus*, so to speak,' says M. de Blainville, 'is no more than a *Comatula* reversed, (even supposing that this position is not equally natural to it, which I am strongly inclined to think,) and which, instead of hooking on by means of accessory rays, is fixed by a prolongation of the centro-dorsal part.'

However more appropriate the name proposed by M. de Blainville may be, that of Dr. Fleming would have the right of priority according to the law of nomenclature; but if Mr. Thompson be right we are spared all consideration on this point; for in the 'Proceedings of the Royal Society of London' (June, 1835), he has expressed his opinion that his *Pentacrinus Europæus*, discovered in the Cove of Cork, and on other parts of the coast of Ireland, is fixed by its stem to other bodies in early life only; that it is produced from the ovum of *Comatula*, becomes afterwards detached, and forms a perfect Comatula, capable of moving freely in the ocean, crawling sometimes among submarine plants, and at others floating or swimming like the Medusæ.

Poteriocrinites.

Generic Character.—A crinoidal animal, with a round column, composed of numerous thin joints, having in their centre a round alimentary canal, and articulating by surfaces striated in radii. Round auxiliary side-arms proceeding at irregular distances from the column. Pelvis formed of five pentagonal plate-like joints, supporting five hexagonal intercostal plate-like joints, and five plate-like scapulæ, having on one of the intercostals an interscapulary plate interposed. An arm proceeding from each of the scapulæ. *Base* probably fascicular, and permanently adhering. (Miller.)

The author of this generic character says, 'It is with considerable hesitation that I describe these five plates as belonging to the pelvis; the analogy of their lower articulating surfaces seems perhaps rather to indicate their belonging to the first costal series. I have never yet had an opportunity of seeing the connection of these plates with the first column or joint fairly developed, and it seems possible that the true pelvis may be small and almost concealed. This doubt will be done away by the acquisition of more instructive specimens, and my thus stating the case must be considered as resulting from an anxious desire to check errors. It is not unlikely that the real joints forming the pelvis are so much abbreviated as not to be visible externally. Every one acquainted with fossils must be aware how difficult it is to trace always organic details in them correctly, and how many specimens are sometimes necessary to ascertain a single fact.'

M. de Blainville observes that this genus does not appear to differ from Apiocrinites, excepting inasmuch as that the stem is not enlarged at its superior part, and that the basilary pieces of the rays are less approximated, and without doubt less immoveable. The details given by Mr. Miller point out a form differing strongly from that of Apiocrinites, and, if his data be admitted, there can be little doubt of the generic difference which he records.

Example. *Poteriocrinites tenuis. Thin, vase-like, lily-shaped animal.*

Description.—A crinoidal animal, with a column formed of numerous round thin joints, surface of articulation radiating and striated. The plate-like joints forming the cup-like body, articulating by minute striæ. One arm proceeding from each scapula, supporting two fingers. Locality, the mountain-limestone of the Mendip Hills, and in the Black Rock (the fourteenth bed of Dr. Bright's series (*Geol. Trans.*, vol. iv. p. 193), near the river Avon, Bristol, belonging to the same formation. (Miller.)

The other species recorded by Miller is *Poteriocrinites crassus*, from the mountain-lime in Yorkshire, and the mountain-lime at Bristol, near the river Avon, Bed 1. and 14. of Dr. Bright's paper in Trans. of Geol. Soc., vol. iv., p. 193, and in the magnesian beds of the mountain-limestone, Clevedon Bay, Somersetshire. Miller further states that the specimen mentioned in Dr. Woodward's catalogue of foreign fossils (page 19, 8. 1.) as coming from Syria, is of this species, and that he (Miller) is indebted to the Rev. A. Sedgwick, Woodwardian Professor, Cambridge, for ascertaining this fact, he having kindly furnished Mr. Miller with a drawing made from the original, now in Dr. Woodward's collection, and under his care.

Platycrinites.

Generic Character.—A crinoidal animal, with an elliptic or (in one species) pentagonal column, formed of numerous joints, having a few side-arms at irregular distances. Pelvis saucer-shaped, formed of three unequal pieces, from which five large plate-like scapulæ proceed. *Base* provided with numerous fibres for attachment. Miller, who thus characterizes the genus, observes that the want of costæ supplied by the large plate-like scapulæ gives the superior part of these animals a pentagonal appearance, and furnishes so conspicuous a character, that they are readily distinguished from all other genera.

Example. *Platycrinites lævis, smooth, broad-plated, lily-shaped animal.*

Description.—A crinoidal animal, with a column formed of very muscular elliptical joints adhering by a transverse ridge. Round side-arms occasionally proceeding from the column, whose joints adhere by radiated surfaces. Pelvis saucer-shaped, with the five scapulæ adhering to it, from each of which an arm proceeds supporting two hands, having each two fingers. Pelvis and scapulæ smooth. Locality, in the mountain-limestone of the Mendip Hills, the Black Rock (14th bed of Dr. Bright's series, in Geol. Trans., vol. iv.) near Bristol; Dublin; Cork. (Miller.)

Miller remarks that he has noticed in the collection of Richard Bright, Esq., of Ham Green, near Bristol, numerous joints, probably appertaining to an animal forming a variety, or a distinct species. They came, he states, from Muir-kirk, in Dumfriesshire; and he adds that the scapulæ are shorter in proportion than those of the former species, and that the columnar joints are finely tuberculated.

The same author records the following species:—*P. rugosus*, from the mountain-limestone at Caldy Island, on the south coast of Wales; and at the Mendip Hills; *P. tuberculatus*, from the mountain-lime strata; *P. granulatus*, from the mountain-limestone of the Mendip Hills; *P. striatus*, from the Black Rock (14th bed of Dr. Bright's series); and *P. pentangularis*, from the mountain-lime of the Mendip Hills, at Weston-super-marĕ, Black Rock near Bristol, and at Mitchel-Dean; also occasionally in transition limestone of Dinevawr Park, and Dudley.

Goldfuss names and describes two additional species, viz. *P. depressus* and *P. ventricosus*.

Cyathocrinites.

Generic Character.—A crinoidal animal, with a round or pentagonal column, formed of numerous joints, having side-arms proceeding irregularly from it. On the summit adheres a saucer-shaped pelvis of five pieces, on which are placed in successive series five costal plates, five scapulæ, and an intervening plate. From each scapula proceeds one arm, having two hands. Locality, transition and mountain-limestone strata. (Miller.)

Example. *Cyathocrinites planus.*

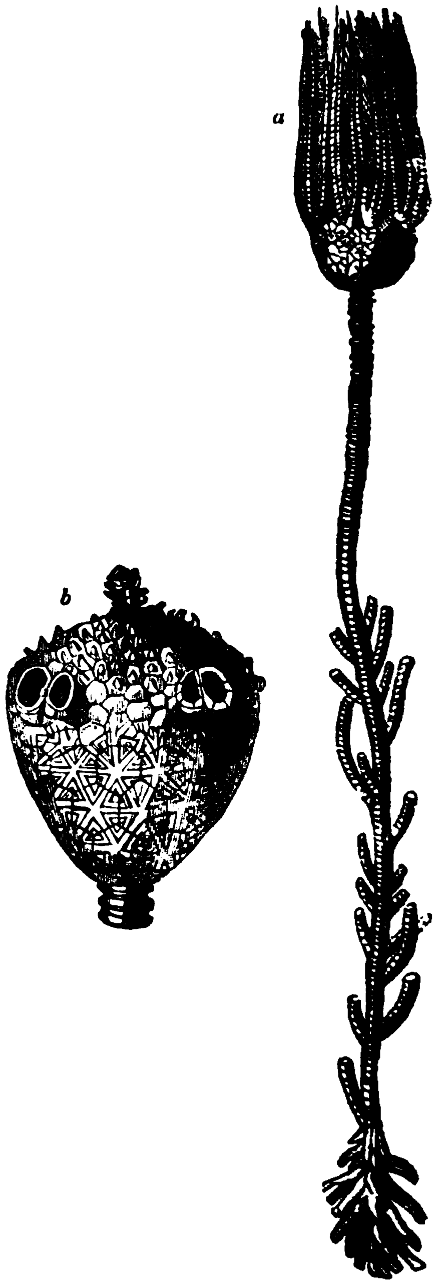
Description.—A crinoidal animal, with a round column formed of numerous depressed joints, articulating by radiating surfaces, and perforated by an alimentary canal, pentagonal near the pelvis, which becomes round further from it. From each of the scapulæ, which rest on the summit of the cup formed by the pelvis and costæ, proceeds an arm supporting two hands, each being provided with two series of fingers. Locality, Clevedon, in the magnesian beds of the mountain-limestone; at Wood-spring, Black Rock (14th bed of Dr. Bright's series), near Bristol. (Miller.)

Miller observes, that a specimen had occurred to him where the columnar joints were alternately smaller and larger, but that he was not aware whether it possessed sufficient character to be considered a variety of the former species. The same author records three other species, ar Goldfuss has added three more, viz. *C. pinnatus*, *C. geometricus*, and *C. pentagonus*.

Actinocrinites.

Generic Character.—A crinoidal animal, with a rou column composed of numerous joints, perforated by a r alimentary canal. At the summit of the column is pla a pelvis formed of three plates, on which five first c and one irregular costal adhere, which are succeeded the second costals and intercostals and the scapulæ, fr whence five arms proceed, forming two hands with sev tentaculated fingers. Round side-arms proceed at irreg distances from the column, which terminates at the b a fascicular bundle or root of fibres.

Example. *Actinocrinites Triacontadactylus.* Th



a, Actinocrinites Triacontadactylus (reduced); b, Body of the same (nat. size). (Miller and Buckland.)

fingered, radiated, lily-shaped animal. (Miller.) *Rock Plant* (Beaumont), *Nave Encrinite* (Parkinson).

Description.—A crinoidal animal, with a round column formed of many joints, on whose summit is placed a pelvis of three plates supporting five hexagonal and one pentagonal costal plate, on which the second costals, intercostals, and scapulæ in series adhere, the latter sending off five arms, having each two hands provided with three fingers. Column sending off at irregular distances auxiliary side-arms, and terminating at the base in a bundle of fibrous elongations resembling roots. Locality, mountain limestone at the villages Broughton and Stokes, in Craven, Yorkshire (Lister, 1674), mountain lime formation of the Mendip Hills (Beaumont), and the Black Rock near Bristol (Miller).

Miller describes another species, *A. polydactylus*, from the mountain limestone of the Mendip Hills and Caldy Island. De Blainville observes that among the five (seven) new species which Goldfuss refers to this genus, viz. *A. granulatus*, *A. tesseracontadactylus*, *A. cingulatus*, *A. muricatus*, *A. nodulosus*, *A. moniliferus*, and *A. lævis*, *A. tesseracontadactylus* appears to De Blainville to offer a new combination of the pieces of the test, and even, perhaps, of the ten rays of the root, each division being dichotomous.

Melocrinites. (Goldfuss.)

Generic Character.—*Column* smooth, perforated by a smooth or quinquelobate canal. *Auxiliary arms.* . . . *Pelvis* composed of four articulations or pieces. *Primary and secondary costals* five, hexagonal, alternately placed (with [illegible]). *Intercostals* five, hexagonal. *Scapulæ* five, hexagonal, placed upon the costals. *Interscapulars* four, in the region of the mouth five. *Arms* five. *Mouth* at the side of the vertex.

Example, *Melocrinites hieroglyphicus.* (Goldfuss).

Description.—*Melocrinites* with the articulations or pieces of the cup or calyx nodulous. Locality, mountain lime, calcareum montanum Eifliæ.) Goldfuss records a second species, viz. *Melocrinites lævis.*

Rhodocrinites. (Miller.)

Generic Character.—A crinoidal animal, with a round and sometimes slightly pentagonal column, formed of numerous joints perforated by a pentapetalous alimentary canal. The pelvis formed of three pieces supporting five square plates, in the spaces of whose lateral bevelled angles five heptagonal first costals are inserted. From the scapulæ proceeds an arm supporting two hands. (Miller.)

Example. *Rhodocrinites verus, true rose-like lily-shaped animal.* Locality, upper bed, No. 1, and one of the lower beds, No. 15, of Dr. Bright's series, distinguishing the mountain limestone formation along the river Avon near Bristol, the Mendip Hills, Mitchel Dean, the transition limestone at Dudley. (Miller.)

Goldfuss adds four species, viz. *R. gyratus*, *R. quinquepartitus*, *R. canaliculatus*, and *R. echinatus*, the last being *Encrinus echinatus* of Schlotheim.

Eugeniacrinites. (Miller.)

Generic Character.—Superior columnar joint subpentangular, enlarging above, having the five plates of the pelvis adhering to it by a solid anchylosis. Base, column, joints resting on the pelvis, and fingers unknown. (Miller.)

Example. *Eugeniacrinites quinquangularis* (Miller), *Clove Encrinite* of Parkinson, *Caryophyllus lapideus*, *Caryophyllite* of Knorr. Locality, Switzerland, at Mount Randen (Knorr); also in the canton Zurich and Schaffhausen. (Miller.) Goldfuss records the following additional species, viz. *Eu. caryophyllatus*, *Eu. nutans*, *Eu. compressus*, *Eu. pyriformis*, *Eu. mespiliformis*, and *Eu. Hoferi* (Münster).

Solanocrinites. (Goldfuss.)

Generic Character.—*Column* very short, pentagonal, perforated by a pentagonal canal, radiato-rugose at the base, depressed or hollowed out at the sides by the glenoid cavities of the auxiliary arms, articulated with the pelvis by slightly prominent rays which are trochitic and nodulous. Pelvis with five articulations. Scapulæ, arms? Auxiliary arms of the column thick and elongated. (Goldfuss.)

Example. *Solanocrinites costatus.* (Goldfuss.)

Description.—S. with a truncated column, 10 or 15-ribbed longitudinally; articulations of the pelvis linear, tuberculated. Locality, Wurtemburg Jurassic limestone. (Goldfuss.)

M. Goldfuss describes two other species, *S. scrobiculatus* (Münster), and *S. Jaegeri* (calcareous) (Goldfuss), from the Jurassic limestone, Bareuth.

Caryocrinites. (Say.)

Generic Character.—*Pelvis* of four plates. *Costal* plates six. *Column* not dilated. Alimentary canal round. Articulating surface of the columnar joints radiated. *Auxiliary side-arms* cylindrical and placed irregularly.

Example. *Caryocrinites ornatus.*

Description.—*Costals*, four pentagonal and two hexagonal. *Column* inserted into a cavity at the base of the pelvis; *pelvis* rather large; two of the plates quadrangular, attenuated to the base where they are truncated and a little recurved at the junction with the column; disks, particularly towards the base, granulated, with a distinct elevated interrupted line; two remaining plates pentangular, attenuated to the base, where they are truncated and a little recurved at the junction with the column; disk with elevated granules, and with two elevated interrupted lines extending to the terminal angles; *costals*, four pentagonal and two hexagonal, all with elevated interrupted lines, radiating from the centre to the angles, with a series of truncated granules on each side, and a few granules in the intervening spaces; interscapulars, two hexagonal, situated immediately above the hexagonal costals; *scapulars* six, pentagonal, the upper sides of which are more or less irregular by projecting a little between the scapulæ, all with prominent lines granulated, similar to those of the preceding: *arms* six: *capital plates* with a heptagonal one in the middle, surrounded by five heptagonal plates and two irregular ones at the mouth: mouth not prominent, situated on one side of the middle, a little within the line of the arms, closed by small valvular pieces, its inferior side resting on the superior angle of one of the scapulars. Longitudinal diameter from three quarters to one inch and a half; transverse diameter from seven tenths to one inch and two fifths. Mr. Say, who gives this description, records and describes another species with one of the costals hexagonal, viz. *C. loricatus.* Locality: Found by Dr. Bigsby loose in brown clay at the foot of the ravine at Lockport, in which the New York canal mounts the parallel ridge of Lake Ontario.

Marsupites (Mantell), Marsupiocrinites (De Blainville).

Generic Character.—*Body* regular, oval, bursiform, rounded at the dorsal extremity, truncated and flattened at the other, enveloped in a sort of shell or test composed of great polygonal plates, articulated to each other, one centrodorsal, and three rows superposed, of which the terminal one supports ten simple rays. *Mouth* in the midst of four squamiform pieces. *Stem* none. This is De Blainville's character; the following is Miller's:—An unattached animal with a subglobose body containing the viscera protected by calcareous plates, of which that in the centre at the base is angular, having a series of costal plates resting on it, admitting intercostals at their superior angles, these giving insertion to the scapulæ from which the arms proceed. Space between the scapulæ covered by an integument protected by numerous small plates.

Example. *Marsupites ornatus, ornamented purse-like* animal (Miller), *Tortoise Encrinite* (Parkinson).

Description.—A purse-like* animal, having the central plate at the base of its subglobose body containing the viscera; pentagonal, supporting at its edge five similar costals, which admit at their superior angles five hexagonal intercostals, into the angles of which five scapulæ are inserted sending off the arms. All the plates ornamented by ridges proceeding from the centre, and forming angular markings near the corners. Locality, Offham Chalk-pits near Lewes; Clayton Chalk-pits, Hurstpoint, Sussex; Preston Chalk-pits, near Brighton (Mantell); Chalk-pits of Kent, and Chalk-pits, near Warminster. (Miller.)

Mr. Miller does not admit Marsupites among the *Crinoidea*, but considers it as the immediate link between that family and *Euryale*.

Pentremites. (Say.)

Generic Character.—*Column* cylindrical, perforated; segments articulating by radiated surfaces, with cylindrical side-arms at irregular intervals; *pelvis* of three unequal pieces, two pentagonal and one tetragonal; scapulæ large, very profoundly emarginate for the reception of the tips of the radiating ambulacræ, obliquely truncated at the extremities on each side, for the reception of one side of a subrhomboidal plate or interscapular; ambulacræ five, radiating from the summit, and terminating at the tips of the emarginations of the scapulæ:-each with a longitudinal, indented line, and numerous transverse striæ which terminate in a marginal series of pores, for the transmission of respiratory tubes; *summit* with five rounded openings (ovaries) and an angulated central one (mouth and anus). (Say.)

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* Miller's expression is "a *Marsupial* animal;" more objectionable when considered in reference to the Vertebrated Marsupiata.

'This singular genus,' observes Mr. Say, 'is so remotely allied to any hitherto discovered, that I do not think it can, with propriety, be referred to any family yet instituted. By its columnar support it is related to the family *Crinoidea;* but the total absence of arms and hands excludes it from that very natural group. The superior termination, in which the ambulacræ, the rounded openings, and the central angulated one, are situated, has some affinity to the family *Echinidea* (Echinidæ), but the columnar support shows that it cannot be arranged there. Having thus on its inferior portion a resemblance to the Crinoidea, and on its superior surface a decided analogy to the *Echinidea,* I think it may with propriety form an intermediate family under the following name and characters: Family, *Blastoidea. Column* composed of numerous articulating segments, supporting at its summit a number of plates, so united as to form a calyciform body containing the viscera; arms none; branchiæ arranged in ambulacræ. In a natural series their bodies constitute the link between the Crinoidea and the Echinidea, on the one hand; whilst, on the other, the former is unquestionably, but not more obviously connected with the Stelleridiea (Stellirideans) by the unequivocal intervention of Comatula and Marsupites. Of all the genera of Crinoidea, it is to Platycrinites that Pentremite seems most closely related.'

Mr. Say describes three species, viz. *P. globosa,* brought from England, and said to have been found in the vicinity of Bath; and *P. pyriformis* and *P. florealis,* from Kentucky. He gives, as the synonyms of the latter, *Kentucky Asterial Fossil* (Parkinson), and Encrinites *florealis* (Schlotheim), as quoted by Miller, and thus proceeds: 'This is extremely abundant in many parts of Kentucky, and on the margins of the Mississippi in a few places. Near Huntsville they are very numerous; and on the surface of a fragment of rock, three inches long by two and a quarter wide, sent to the Academy by Mr. Hazard of that place, I have enumerated eighteen specimens of this species more or less entire, and two specimens of the preceding species (*P. pyriformis*). On another still smaller piece of rock are twenty-one specimens, all in *alto relievo,* two of which are of the preceding species. On a third fragment of rock thirty may be counted, and on a fourth upwards of fifty. That these animals were pedunculated and fixed, there cannot be any doubt. We see at the base of the pelvis a small rounded surface, perforated in the centre for the passage of the alimentary canal, and on the outer margin are very short but distinct radii of elevated lines, evidently intended for articulation with the first joint of the column. The column itself is always found in fragments accompanying the body of the animal, but never attached to it. I think it highly probable that the branchial apparatus communicated with the surrounding fluid through the pores of the ambulacræ by means of filamentous processes: these may also have performed the office of tentacula in conveying the food to the mouth, which was perhaps provided with an exsertile proboscis; or may we not rather suppose that the animal fed on the minute beings that abounded in the sea water, and that it obtained them in the manner of Ascidia, by taking them in with the water. The residuum of digestion appears to have been rejected through the mouth.'

Mr. G. B. Sowerby, in a '*Note on the foregoing paper, together with a description of a new species of Pentremites,*' observes, that all the specimens received in this country from Kentucky were changed into a sort of calcedony or chert, a circumstance which has perhaps not only prevented British naturalists from forming a correct judgment of their natural affinities as a family, but appears also to have had the effect of preventing them from recognising the generic resemblance to the species that occur here, which, bearing so much greater a similarity to some of the *Echinidæ,* has caused some of our naturalists to class them together: for it is observable, he remarks, that of perhaps twenty specimens of the Kentucky Asterial Fossil that he had examined, only one individual showed the sutures that separate what Say calls the 'pelvic scapular and interscapular plates or pieces.' The examination of the new species however suggested to Mr. Sowerby the probability that part of the three unequal pieces which Say calls the pelvis may in fact prove to be *costals,* thus evidencing one more relation to the *Crinoidea.* Mr. Sowerby records and describes two species, premising that the circumstance of Say's first species, *P. Globosa,* having been brought from England, led Mr. Sowerby at first to suppose that Say might refer to one of those species that had come into Mr. Sowerby's hands. Say's description however in Mr. Sowerby's opinion is so incomplete, and the terms he has used are so vague, that Mr. Sowerby had not been able to ascertain the fact, but thinks, nevertheless, that '*Pelvis* deep saucer-shaped convex' may serve to distinguish it from both. Mr. Sowerby's two species are *Pentremites Derbiensis* from Derbyshire (limestone) and *Pentremites elliptica* from near Preston in Lancashire.

In a second paper (*Zool. Journ.,* vol. iv.) Mr. Sowerby changes the name to *Pentatrematites,* and records three more species, viz. *P. angulata, P. inflata,* and *P. oblonga;* all from the calamine mines belonging to the duke of Buccleuch, on the Lancashire side of the Hodder; and in the last volume of the 'Zoological Journal,' he describes three in addition, viz. *P. orbicularis, P. acuta,* and *P. pentangularis;* the last he considers to be the *Platycrinites pentangularis* of Miller, the arms being imaginary in his figure. Goldfuss describes a species from the transition limestone near Dusseldorf

M. de Blainville places this genus at the end of the Crinoideans. It appears to be the connecting link between the Crinoidea and the Echinidæ, but to have a much stronger relationship to the former than to the latter. Marsupites we consider with Miller, Say, and others, to be the connexion between the true *Crinoideans* and the *Comatulæ.*

N.B. Goldfuss's *Glenotremites paradoxus* appears to approximate somewhat to *Pentremites.*

ENCYCLOPÆDIA. [DICTIONARY.]

ENCYCLOPE'DIE is the name of several general dictionaries of the arts and sciences in the French language. [DICTIONARY.] The first work published under this name was edited by Diderot and D'Alembert, is written in alphabetical order, and is styled 'Encyclopédie, ou Dictionnaire raisonné des Sciences, des Arts, et des Métiers,' 17 vols. fol. and 11 vols. plates, Paris, 1751-72, to which are added a Supplement in 4 vols. fol. of text and 1 vol. plates, Paris, 1776-77, and a Table des Matières, or General Index, 2 vols. fol., Paris, 1780, in all 35 vols. folio. For a brief sketch of the history of this work and the judgment which the editor himself passed upon it, see DIDEROT; and for its plan and arrangement, see the preface to the work itself written by Diderot and D'Alembert. The Encyclopédie exercised a considerable influence on the political as well as religious opinions of the French reading public of the last century. But the incorrectness of many of its articles and the rashness and dogmatism of many of its propositions becoming notorious, a new Cyclopædia was planned by a society of men of letters, upon a scale of greater magnitude, and on a different arrangement, every branch of learning being treated separately, and the whole being written in general with considerable impartiality, and being more free than the former Encyclopédie from party purposes and prejudices: the title of it is 'Encyclopédie Méthodique, par ordre de Matières.' It is the largest work of the kind ever published, consisting of 201 volumes 4to., including 47 volumes of copper-plates. It began to appear in 1782, and was completed only in 1832, the publication having thus lasted half a century. Each science makes a dictionary of itself in two, three, or more volumes, arranged in alphabetical order, and the whole work is therefore a collection of dictionaries. The principal sciences contained in it are: geography antient and modern, physical geography, mathematics, logic and metaphysics, philosophy, history, theology, jurisprudence, political economy and diplomacy, grammar and literature, commercial science, naval art, military art, antiquities, financial science, chemistry, pharmacy, and metallurgy, natural history, ornithology, history of mammalia, anatomy, physics, botany, medicine, surgery, agriculture, fine arts, architecture, music, &c. Other but inferior works have appeared also in France under the name of Encyclopédie, but the Encyclopédie Méthodique remains the standard work of its kind in the French language.

ENDEAVOUR STRAIT. [TORRES STRAIT.]

ENDECAGON, a figure of eleven sides.

ENDECA'NDRIA, the ninth class of the Linnæan system of botany, distinguished by having nine stamens separate from each other.

ENDEMIC (ἐνδημος, *endêmus*, from ἐν, in or among, and δῆμος, people, that which is among a people). By this word are expressed those peculiar forms of disease which arise spontaneously, as it is termed, in a country or in particular localities, and which are ordinarily produced by the peculiar climate, soil, air, water, &c. Thus, ague is the endemic disease of marshy countries or localities; the swelled throat or bronchocele is endemic in the Alps, and the plica in Poland. The word bears pretty much the same signification in relation to the diseases of a country that the term indigenous does to its plants. It is used in contradistinction to *epidemic*. [EPIDEMIC.]

ENDIVE, or **CICHO'RIUM ENDI'VIA**, the parent of all the varieties of garden endive, was introduced to Britain about the beginning of the seventeenth century from the northern provinces of China. It is a species belonging to the cichoraceous division of Compositæ, to which it gives the name Cichoraceæ.

There are now many varieties in cultivation, which are divided, by those who have classed them, into two principal groups, Batavian and Curled-leaved; arranging under the former all those with broad rugged leaves, and under the latter those in which the leaves are narrower and curled. The French call the first of these *Scaroles* and the last *Chicorées*.

As it is the leaves of this plant, and not its flowers or seed, which are used in culinary operations, it is necessary to be particular as to the time of sowing; for if sown early in spring, it will, instead of forming fine leaves, produce flowers and seed, and so frustrate the object of the cultivator. A little seed may be sown in the beginning of May for early use; but for a general crop, throughout the months of June, July, to the middle of August, will be found to be the proper time for sowing. The soil upon which the endive is sown or planted should be light and rich. After the plants are strong enough to be removed from the seed-bed and planted out where they are intended to remain, various methods are practised in order to blanch the leaves. Some gardeners plant in drills two or three inches deep, and earth up the plants as they grow; others, after they are fully grown, cover them with flower-pots or something of that description, and so exclude the light; while others again simply tie the leaves close together with a piece of matting, when the same result is obtained. The object of thus blanching the plants is not merely to render the endive colourless when employed as salad, but to diminish its natural bitterness, which in its concentrated state would render it unfit for food.

Endive-plants are impatient of wet in cold weather, being apt to rot in open situations. Care, therefore, should be taken to protect them by mats or boards upon the approach of winter.

In this country the cut-leaved or 'curled' endive is preferred for table; but the dwarf white Batavian endive is much more delicate and agreeable to the palate.

E'NDOGENS. One of the large primary classes into which the vegetable kingdom is divided bears this name in consequence of its new woody matter being constantly developed in the first instance towards the interior of the trunk, only curving outwards in its subsequent course downwards. That palm-trees grow in this way was known as long since as the time of Theophrastus, who distinctly speaks of the difference between endogenous and exogenous wood.

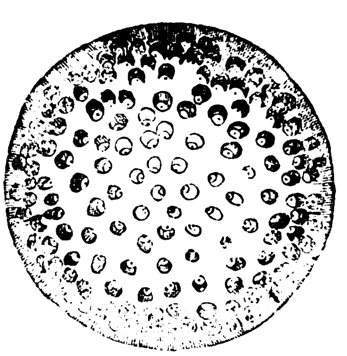
But that this peculiarity is also extended to a considerable part of the vegetable kingdom is a modern fact, the discovery of which we owe to the French naturalists Daubenton and Desfontaines. The path being thus opened, the inquiry has subsequently, and more particularly of late years, been much extended, especially by Professor Mohl, in an elaborate essay upon the anatomy of palms. In the following observations we shall be found to differ in some respects from all the previous writers upon this subject, but at the same time a considerable part of our statements will necessarily be in accordance with those of one observer or another. We do not think it advisable, except here and there, to interrupt the thread of our argument by any references to these discrepancies; the reader learned in such matters will be able to separate the views that are new from such as have previously been promulgated; others would be little interested in the matter.

Mohl is of opinion that the first year's wood of an exogen is analogous in arrangement to that of an endogen, the woody bundles of each leaf curving upwards and outwards to the base of the leaf, and downwards and outwards towards the bark, crossing through those which have been previously developed.

For convenience we will take the phenomena of growth in a palm-tree as typical of the endogenous structure. In the beginning the embryo of a palm consists of a cellular basis, in which a certain number of cords of ligneous fibre are arranged circularly (fig. A, p. 296), down the radicle, deriving their origin from the plumule. Immediately subsequent to germination, and as soon as the rudimentary leaves of the plumule begin to lengthen, spiral vessels appear in their tissue in connection with the ligneous cords; the latter increase in quantity as the plant advances in growth, shooting downwards through the cellular tissue, and keeping parallel with the outside of the root. At the same time the cellular tissue increases in diameter to make room for the descending ligneous cords (or woody bundles, as they are also called). At last a young leaf is developed with a considerable number of such cords proceeding from its base downwards, and, as its base passes all round the plumule, consequently passing downwards alike on all sides of the centre that it surrounds. Within this a second leaf gradually unfolds, the cellular tissue increasing horizontally at the same time; the ligneous cords, however, soon cease to maintain any thing like a parallel direction, but curve outwards as they pass downwards, losing their extremities in the roots, or in the cellular integument on the outside of the first circle of cords (*fig.* A); at the same time the second leaf pushes the first leaf a little from the centre towards the circumference of the plane or cone of growth; the consequence of which is that the ligneous cords next the base of the first leaf are drawn a little outwards, and form descending arcs which henceforwards are found at first to curve inwards towards the centre of the young stem, and afterwards outwards towards its circumference. In this manner leaf after leaf is developed, the horizontal cellular system enlarging all the time, and every successive leaf, as it forms at the growing point, emitting more woody bundles curving downwards and outwards, and consequently intersecting the older arcs at some place or other; the result of this is that the first formed leaf will have the upper end of the arcs which belong to it longest and much stretched outwardly, while the youngest will have the arcs the straightest; and the appearance produced in the stem will be that of a confused entanglement of woody bundles in the midst of a quantity of cellular tissue. As the stem extends its cellular tissue longitudinally while this is going on, the woody arcs are consequently in proportion long, and in fact usually appear to the eye as if almost parallel, excepting here and there, where two arcs abruptly intersect each other. As in all cases the greater number of arcs curve outwards as they descend, and eventually break up their ends into a multitude of fine divisions next the circumference, where they form a cortical integument, it will follow that the greater part of the woody matter of the stem will be collected near the circumference, while the centre is kept comparatively open, and will consist chiefly of cellular tissue; and when, as in many palms, the stem has a limited circumference, beyond which it is its specific nature not to distend, the density of the circumference must, it is obvious, be proportionably augmented. It is however a mistake to suppose that the great hardness of the circumference of old palm wood is owing merely to the presence of augmenting matter upon a fixed circumference; this will account but little for the phenomena. We find that the woody bundles next the circumference are larger and harder than they originally were, and consequently we must suppose that they have the power of increasing their own diameter subsequent to their first formation, and that they also act as reservoirs of secretions of a hard and solid nature, after the manner of the heartwood of exogens.

When the growth of the stem of an endogen goes on in this regular manner, with no power of extending horizontally beyond a specifically limited diameter, a stem is formed, the transverse section of which presents the appearance shown in the following cut.

There is a number of curved spots crowded together in a



confused way, most thick and numerous at the circumference, comparatively small and thinly placed at the centre; and the only regular structure that is observable with the naked eye is that the curves always present their convexity to the circumference.

When there is no limited circumference assigned by nature to an endogen, then the curved spots, which are sections of the woody arcs, are much more equally arranged, and are less crowded at the circumference. Never is there any distinct column of pith, or medullary rays, or concentric arrangement of the woody arcs; nor does the cortical integument of the surface of endogenous stems assume the character of bark, separating from the wood below it; on the contrary, as the cortical integument consists very much of the finely divided extremities of the woody arcs, they necessarily hold it fast to the wood, of which they are themselves prolongations, and the cortical integument can only be stripped off by tearing it away from the whole surface of the wood, from which it does not separate without leaving myriads of little broken threads behind.

We therefore do not understand Professor Mohl when he asserts that the young wood of an exogen is the same as that of an endogen, and that they principally differ in exogens forming new wood between the old wood and liber, while endogens produce separate cords of woody tissue. On the contrary, exogens are, from the beginning of their growth, extremely different, collecting their woody cords in a parallel manner between those horizontal prolongations of the cellular system called medullary rays; there are no arcs developed; the cortical integument is altogether separate from the woody system, without any breaking off of the woody tubes; and, finally, there is a distinct column of cellular medulla, around which the wood itself is more or less concentrically disposed. We know very well that the disposition to form woody arcs in the pith, in addition to the concentric wood, which is so very conspicuous in Zamia, is also found elsewhere, as in Piper; and that something like it, although far from being correctly understood by Schultz, occurs in the pith of certain nyctaginaceous plants, as well as in elder, where it has been noticed by Henslow; but these cases are far from showing anything like identity between endogens and exogens, as will be more particularly explained in another place. [EXOGENS.]

While however we object to Mohl's identification of exogens and endogens, as most forced and unnatural, and essentially at variance with observation, we are far from adopting the language of Link, who calls a palm stem a *cauloma*, as if it were not a stem at all. That there is in the stem of an endogen and an exogen the same elementary matter; that the woody bundles of the former are analogous to the woody plates of the latter, that the function of their stems, although not made out with much precision, is nevertheless essentially similar, are facts about which we cannot anticipate any dispute, and therefore the new term cauloma, as distinguished from caulis, is just as superfluous as the old name of frond as distinguished from leaf.

In many of the larger kinds of endogens the stem increases principally by the development of a single terminal bud, a circumstance unknown in exogens, properly so called. In many however, as all grasses, the ordinary growth takes place by the full development of axillary buds in abundance.

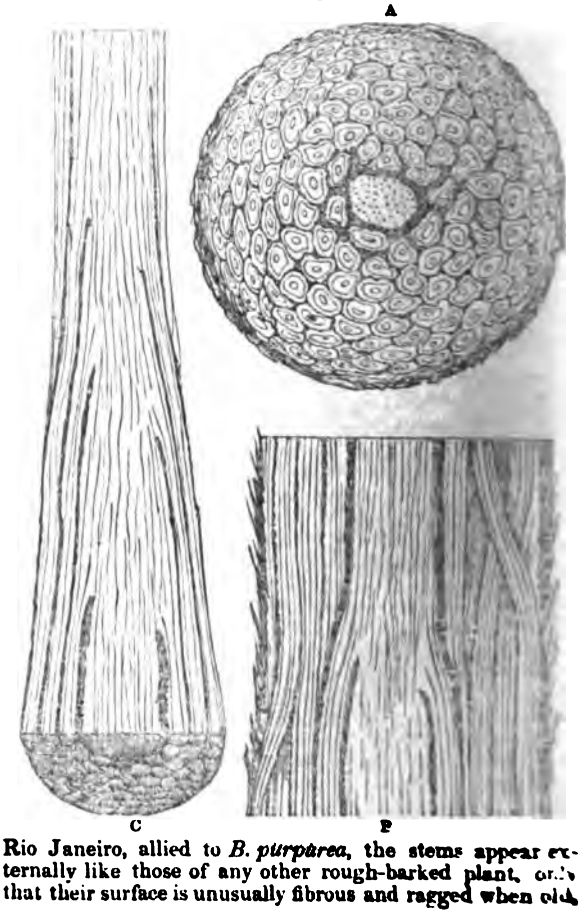
In general there is so great a uniformity in the structure of an endogenous stem that the common cane or asparagus illustrate its peculiarities sufficiently. There are however anomalous states that require explanation.

Grasses are endogens with hollow stems strengthened by transverse plates at the nodes. This is seen in the bamboo, whose joints are used as cases to hold rolls, or in any of our indigenous species. In this case the deviation from habitual structure is owing to the circumference growing faster than the centre, the consequence of which is the tearing the latter into a fistular passage, except at the nodes, where the arcs of ligneous tissue originating in the leaves cross over from one side of the stem to the other, and by their entanglement and extensibility prevent the possibility of any rupture taking place. That this is so is proved by the fact that the stems of all grasses are solid, or nearly so, as long as they grow slowly; and that it is when the rapidity of their development is much accelerated that they assume their habitual fistular character. Independently of that circumstance their organization is quite normal.

Xanthorhœa hastilis has been shown by De Candolle to have an anomalous aspect. When cut through transversely, the section exhibits an appearance of medullary rays proceeding with considerable regularity from near the centre to the very circumference. (*Organographie Végétale*, t. 7.) But such horizontal rays are not constructed of muriform cellular tissue like real medullary processes, but are composed of ligneous cords lying across the other woody tissue; they are in fact the upper ends of the woody arcs pulled from a vertical into a horizontal direction by the growth of the stem and the thrusting of the leaves to which they belong from the centre to the circumference. Such a case throws great light upon the real nature of the more regular forms of endogenous wood.

Other appearances are owing to imperfect development, as in some of the aquatic species of this class. *Lemna*, for example, has its stem and leaves fused together into a small lenticular cavernous body; and in *Zannichellia* and others, a few tubes of lengthened cellular tissue constitute almost all the axis; but the examination of such cases is comparatively unimportant, and would lead too much into details of subordinate interest.

By far the most striking kind of anomaly in the stem of endogens is that which occurs in *Barbacenia*, and which has been already slightly noticed by the writer of this sketch. (*Nat. Syst. of Botany*, p. 334.) It is so very important that we shall describe it more particularly on this occasion. In an unpublished species of *Barbacenia* from Rio Janeiro, allied to *B. purpùrea*, the stems appear externally like those of any other rough-barked plant, only that their surface is unusually fibrous and ragged when old.



and closely coated by the remains of sheathing leaves when young. Upon examining a transverse section of it, the stem is found to consist of a small firm pale central circle having the ordinary endogenous organization, and of a large number of smaller and very irregular oval spaces pressed closely together but having no organic connection; between these are traces of a chaffy ragged kind of tissue which seems as if principally absorbed and destroyed. (See fig. A.)

A vertical section of the thickest part of this stem exhibits, in addition to a pale central endogenous column, woody bundles crossing each other or lying parallel, after the manner of the ordinary ligneous tissue of a palm stem (fig. B), only the bundles do not adhere to each other, and are not embodied as usual in a cellular substance. These bundles may be readily traced to the central column, particularly in the younger branches (fig. C), and are plainly the roots of the stem, of exactly the same nature as those aërial roots which serve to stay the stem of a screw pine (*Pandanus*). When they reach the earth the woody bundles become more apparently roots, dividing at their points into fine segments, and entirely resembling on a small scale the roots of a palm-tree. The central column is much smaller at the base of the stem than near the upper extremity.

Nothing can well show more distinctly than this, that the woody bundles of an endogenous stem are a sort of root emitted by the leaves, plunging down through their whole length into the cellular substance of the stem in ordinary cases; but in barbacenia soon quitting the stem and continuing their course downwards on the outside. The observation of Du Petit Thouars, that when dracænas push forth branches, each of the latter produces from its base a quantity of fibres, which are interposed between the cortical integument and the body of the wood, forming a sort of plaster analogous to what is found in the graft of an exogen; and that of the fibres just mentioned the lowermost have a tendency to descend, while those originating on the upper side of the branch turn downwards and finally descend also; that observation had already rendered the above-mentioned conclusion probable. The case of barbacenia can scarcely leave a doubt upon the subject, and leads to the important conclusion that the theory of the wood of exogens being also a state of roots belonging to the leaves of the stem, is well founded also.

The age of endogenous trees has been little studied. When the circumference of their stem is limited specifically, it is obvious that their lives will be limited also; and hence we find the longevity of palms inconsiderable when compared with that of exogenous trees. Two or three hundred years are estimated to form the extreme extent of life in a date palm and in many others. But where, as in Dracæna, the degree to which the stem will grow in diameter is indefinite, the age seems, as in exogens, to be indefinite also· thus a famous dragon tree, *Dracæna Draco*, of Oratava in Teneriffe, was an object of great antiquity so long ago as A. D. 1402, and is still alive.

Important as the character furnished by the internal manner of growth of an endogen obviously is, it is much enhanced in value by its being found very generally accompanied by peculiarities of organization in other parts. The *leaves* have in almost all cases the veins placed in parallel lines, merely connected by transverse single or nearly single bars. Straight-veined foliage is therefore an external symptom of an endogenous mode of growth. When such an appearance is found in exogens it is always fallacious,

ENDOGENOUS VEGETATION.

Palmaceæ, consisting of Cocos capitata (*a*); Manicaria saccifera (*b*); Iriartea ventricosa (*f*). *Pandanaceæ*, represented by Pandanus odoratissimus (*c*); *Musaceæ* by Musa Sapientum (*d*); *Graminaceæ*, by Bambusa arundinacea (*e*); and arborescent *Amaryllidaceæ*, by Agave Americana (*g*). The fore and back grounds are composed of small palms, grasses, rushes, and liliaceous plants.

and is found to be owing to the excessive size and peculiar direction of a few of the larger veins, and not to be a general character of all the venous system; as is sufficiently obvious in Plantago lanceolata, Gentiana lutea, and many more.

The *flowers* too of endogens have in most cases their sepals, petals, and stamens corresponding with the number three, or clearly referrible to that type; and the pistil usually participates in the same peculiarity. Where such a proportion exists in exogens, it is usually confined to the sepals and petals by themselves, or to the pistil by itself, not extending to the other organs. In endogens it is almost universal in all the whorls of the flower, although sometimes obscured by the abortion, dislocation, or cohesion of particular parts, as happens in the whole of the extensive natural order of grasses.

The effect of the manner of growth in endogens is to give them a very peculiar appearance. Their trunks frequently resemble columns rising majestically with a plume of leaves upon their summit; and the leaves, often very large—the fan-shaped leaves of some palms are from 20 to 30 feet wide—have most commonly a lengthened form, resembling a sword blade if stiff, or a strap if weak and broad. A landscape consisting entirely of endogens would have such an appearance as is presented by the cut in the preceding page.

These peculiarities are connected with others belonging to endogenous vegetation in its most rudimentary condition. The embryo of an endogen is, in its commonest state, a small undivided cylinder, which protrudes from within its substance a radicle from one end and a plumule from a little above the radicle; in other cases its embryo has a slit on one side, in the cavity of which the plumule reposes, or, finally, the embryo is a flat plate as in grasses, with the plumule and radicle attached to its face near the base. In the latter case the flat plate is a solitary cotyledon, which, in the second instance, is folded together so as to give the embryo the appearance of being slit, and which in the first, or most habitual, condition is not only folded up, but united at its edges into a case entirely burying the plumule and cotyledon. Hence the embryo of an endogen is called monocotyledonous; a name that is really unexceptionable, notwithstanding the occasional appearance of a second rudimentary cotyledon, as occurs in common wheat.

It has already been stated that the radicle is protruded in germination from within the substance of the embryo; the base of the radicle is consequently surrounded by a minute collar formed of the edges of the aperture produced by the radicle upon its egress. For this reason exogens are called *endorhizal*.

Hence the great natural class of plants forming the subject of these remarks has five most important physiological peculiarities, by all which combined, or usually by each of which separately, the class may be characterized.

1. The wood is endogenous.
2. The leaves are straight-veined.
3. The organs of fructification are ternary
4. The embryo is monocotyledonous.
5. The germination is endorhizal.

This explains why Endogens are also called *Monocotyledons* and *Endorhizæ;* they have moreover been called *Cryptocotyledoneæ* by Agardh, *Acroblastæ* by Reichenbach, and *Caulophytæ* by the school of Oken; but these names have been given upon mere hypothetical grounds, and are not of sufficient importance to deserve explanation in this place.

It may however be readily supposed that, viewed as a large class of plants, Endogens are essentially characterized only by the combination of these five peculiarities, and that occasional deviations may occur from every one of them. Thus in Nais, Caulinia, Zannichellia, and others which constitute a part of what Professor Schultz names *Homorganous floriferous* plants, the whole organization of the stem is so imperfect that the endogenous character is lost; but their true nature is nevertheless sufficiently indicated by their straight veins, monocotyledonous embryo, &c. Again, in Smilax, the common reticulated leaves of exogens are found; but the endogenous stem, the ternary organs of fructification, the embryo and germination of that order, are all good evidence of its real nature; and so with other cases. Such occurrences are instances of endogenous development tending towards the exogenous, and are usually looked upon as cases of transition from one form to the other—perhaps not very correctly. Of this nature are the resemblances between the columnar Cycadaceous Gymnosperms between the livid, fœtid, one-sided calyx of Aristolochia and the equally livid, fœtid, one-sided spathe of araceous endogens, or, in another point of view, between such lenticular plants as lemna in endogens, with the leaves and stems fused, as it were, together, and similar forms of stem and leaf among marchantiaceous acrogens.

With regard to really intermediate forms of vegetation connecting endogens with other classes, they are extremely uncommon. One of the most striking is that which occurs between Ranunculaceæ and Nymphæaceæ on the part of exogens, and Alismaceæ and Hydrocharaceæ on that of endogens; if Ranunculus lingua, or better R. parnassifolius, is contrasted with Alisma plantago, or Damasonium, leaving out of consideration subordinate differences, it will be found that there is little of a positive nature to distinguish them, except the albuminous dicotyledonous seeds of the former as compared with the exalbuminous monocotyledonous seeds of the latter; and the resemblances between Hydropeltis and Hydrocharis in the other case, are so very great that Schultz and others actually refer them to the same class.

Endogens probably contain more plants contributing to the food of man, and fewer poisonous species in proportion to their whole number, than exogens. Grasses, with their floury albumen, form a large portion of this class, to which have to be added Palms yielding fruit, wine, sugar, sago, Araceæ, Marantaceæ, some Amaryllidaceæ, &c., producing arrow-root, the nutritious fruit of the plantains, the aromatic secretions of Zingiberaceæ, Orchidaceæ forming salep, and Dioscoreaceæ, the mothers of yams. Among the deleterious species we have little worth notice beyond the poisonous mucilage in the bulbs of certain Amaryllidaceæ, and the acrid secretions of Araceæ.

What proportion endogens bear to the whole vegetable kingdom is unknown. De Candolle computes the proportions of the three great classes into which plants used to be divided, thus:

Exogens, or Dicotyledons	. .	636
Endogens, or Monocotyledons	.	144
Acrogens, or Acotyledons	. .	220
		1000

But these numbers can only be regarded as loose approximations to the truth.

In these, as in all other large groups, we find the extremes of development so exceedingly far apart, that one would be almost tempted to doubt the possibility of their being mere forms of each other, were it not certain that numerous traces exist in the vegetable kingdom of a frequent tendency to produce the typical structure of a natural association of whatever kind in both an *exaggerated* and *degraded* state, if such figurative terms may be employed in science. For instance, the genus Ficus contains some species creeping on the ground like diminutive herbaceous plants, and others rising into the air to the height of [illegible] feet, overspreading with the arms of their colossal trunks a sufficient space of ground to protect a multitude of men. The type of organization in the willow is in like manner represented on the one hand by the tiny *Salix herbacea*, which can hardly raise its head above the dwarf moss and saxifrages that surround it; and on the other by *Salix alba*, a tree sixty feet high. Then among natural orders we have the Rosaceous structure, exaggerated, on the one hand, in the arborescent Pomeæ, and degraded, on the other, into the apetalous imperfect Sanguisorbeæ; the Onagraceous type highly developed in Fuchsia, and almost obliterated in Halorageæ; the Urticaceous, in excess in Artocarpus, and most imperfect in Ceratophyllum; grasses, presenting the most striking differences of perfection between the moss-like Knappia, and Bamboos a hundred feet high; and the Liliaceous occurs in equally different states of development, when asparagus is compared with the Dragon-tree, or an autumnal squill with an arborescent Yucca. So, in like manner, we find at one extreme of the organization of the class of Endogens, palms, plantains, and arborescent liliaceous plants, and at the other, such submersed plants as Potamogeton, Zannichellia, and duckweed, the latter of which has not even the distinction of leaf and stem, and bears its flowers reduced to one carpel and two stamens, without either calyx or corolla—therefore at the minimum of reduction, if it remain flowers at all—in little chinks in its edges.

The classification of endogens is not a subject upon which there is any very great diversity of opinion among botanists, if the natural orders are sometimes not distinctly limited, they are, upon the whole, grouped much better than those of exogens; and although it may be expected, whenever more positive rules for classification than are yet known shall have been discovered, that great changes will be introduced into this part of systematic botany, yet we do not contemplate the probability of disturbing the limits of the natural orders themselves to any considerable extent.

According to the views of the writer of this article (*Nat. Syst. of Botany*, ed. 2, p. 330, &c.), there are six principal groups into which endogens may be divided. Of these, four have the organization of the flowers *perfect*, there being in all cases a distinct calyx and corolla, and a regular consolidated cotyledon; and two are *imperfect*, the calyx and corolla being either altogether absent or in an incomplete condition, as in Araceæ, where scale-like bodies are all that represent the floral envelopes, or grasses, in which for calyx and corolla are substituted imbricated scales, and the cotyledon is very commonly rolled up without consolidation or actually flat.

The perfect groups consist, firstly, of plants whose leaves are those of exogens, having reticulated veins, a taper footstalk disarticulating from the stem, and the habit of Menispermaceæ or Aristolochiaceæ: these form the *Retose* group; secondly, of straight-veined plants, some of which have a superior and others an inferior ovary: all those with a superior ovary form the *Hypogynous* group. Those with an inferior ovary separate into two series, of which one has a distinct style and stamens (*Epigynous*), and the other these parts consolidated into a central column (*Gynandrous*).

The two groups of imperfect endogens are the *Spadicose*, in which a coloured spatha is usually present, and the flowers either altogether naked or provided only with rudimentary scales: in these plants the cotyledon is rolled up, but its edges are not united, so that it appears to have a slit on one side; and the *Glumose*, where the flowers have imbricated scales representing the calyx, and frequently minute scales in lieu of a corolla; in these the cotyledon is very usually flat, with the double cone, formed by the plumule and the radicle, adhering to its face at the lower end.

The following table presents this arrangement in one view, and shows under which of the groups the different natural orders are stationed. Of all the more important of the latter, some account will be found in this Cyclopædia at the proper place.

ENDOGENS.

* Perfect. *Flowers complete. (Cotyledon usually rolled up and consolidated over the plumule and radicle.)*

Group 1. EPIGYNOUS. Zingiberaceæ, Marantaceæ, Musaceæ, Amaryllidaceæ, Hæmodoraceæ, Burmanniaceæ, Taccaceæ, Iridaceæ, Bromeliaceæ, Hydrocharaceæ.

Group 2. GYNANDROUS. Orchidaceæ, Vanillaceæ, Apostasiaceæ.

Group 3. HYPOGYNOUS. Palmaceæ, Pontederaceæ, Melanthaceæ, Gilliesiaceæ, Liliaceæ, Commelinaceæ, Butomaceæ, Alismaceæ, Juncaceæ, Philydraceæ.

Group 4. RETOSE. Smilaceæ, Dioscoreaceæ, Roxburghiaceæ.

* * Imperfect. *Flowers incomplete. (Cotyledon not consolidated, frequently quite flat and open.)*

Group 5. SPADICOSE. Pandanaceæ, Cyclanthaceæ, Araceæ, Acoraceæ, Typhaceæ, Naiadaceæ, Juncaginaceæ, Fluviaceæ.

Group 6. GLUMOSE. Graminaceæ, Cyperaceæ, Desvauxiaceæ, Restiaceæ (Eriocauleæ), Xyridaceæ.

ENDORHIZÆ. [ENDOGENS.]

ENDORSEMENT. [BILL OF EXCHANGE.]

ENDOSMOSE is the attraction through an animal or vegetable membrane of thin fluid by a denser fluid. Mons. Dutrochet found that if he filled the swimming bladder of a carp with thin mucilage and placed it in water, the bladder gained weight by attracting water through its sides; to this phenomenon he gave the name of *Endosmose*. He also found that if he filled the same bladder with water and placed it in thin mucilage, it lost weight, its contents being gradually attracted through its sides into the surrounding mucilage; this counter phenomenon he named *Exosmose*. The same circumstances were seen to occur in the transmission of fluids through the tissue of plants; it was found possible to gorge parts of vegetables with fluid by merely placing them in water and to empty them again by rendering the fluid in which they were placed more dense than that which they contained. It was also ascertained that this phenomenon took place with considerable force: Dutrochet says that water thickened with sugar in the proportion of 1 sugar to 2 water, was productive of a power of endosmose capable of sustaining a column of mercury of 127 inches, or the weight of 4¼ atmospheres.

This phenomenon is by its discoverer considered sufficient to explain many of the movements of the fluids both of plants and animals; his first book upon the subject is entitled *L'Agent immédiat du Mouvement Vital, dévoilé dans sa nature et dans son mode d'action chez les Végétaux et chez les Animaux*, Paris, 1826, and in his numerous more recent writings he sustains the same opinion. To the effects of endosmose he refers the motion of sap; the sleep of leaves; the various directions taken by plants under the influence of external agents, such as turning to the light or away from it; many kinds of irritability; the direction of fluids to particular points, and the like. That Mons. Dutrochet's arguments are extremely ingenious, and his observations highly curious, no one will deny; but we quite agree with De Candolle, that, supposing this celebrated physiologist's views to be correct, we must still have recourse to vital force as the great and inexplicable cause of all such phenomena. When organic tissue dies, it does not lose its mere hygrometrical powers, nor do its tubes cease their capillarity, but no more vital movement of fluids takes place; yet mere endosmose will take effect through dead membranes, as is proved by the instrument called an endosmometer. We can only then allow endosmose to be one of the powers which, in combination with vital force, assists in producing some of the phenomena of life.

Dutrochet considers endosmose to be owing to what he calls intercapillary electricity, grounding his opinion partly upon the experiment of Porret, who found that when two liquids of different levels are separated by a membrane, they may be brought to a level by establishing an electrical current between the two, thus rendering the membrane permeable; and partly upon experiments of his own. But M. Poisson, on the contrary, has demonstrated that endosmose may be the result of capillary attraction joined to differences in the affinity of heterogeneous substances. (*Ann. de Chim.*, 1827, v. 35, p. 98.)

ENEMATA. [CLYSTERS.]

ENFEOFFMENT. [FEOFFMENT.]

ENFIELD, WILLIAM, was born at Sudbury, in Suffolk, on March 29, 1741, of humble but truly respectable parents. The disadvantages of his early education, arising from the condition of life in which he was born, were made amends for, in a great degree, by a fondness for reading and incessant labour towards improving his mind. This disposition to literary application introduced him to the notice of Mr. Hextall, the dissenting minister of the place, who kindly and judiciously directed him in his studies. Mr. Hextall's encouragement and advice led to his devoting himself to the Christian ministry. In his seventeenth year he was admitted to the Academy or Dissenting College at Daventry, then conducted by the Rev. Dr. Ashworth. Here he passed through the usual course of study of five years, and was distinguished for his habitual diligence and for an unusual facility and elegance of composition. It was here also that he, with some others of his fellow-students, were among the first of the dissenting ministry who formed the design of making Christian morality the principal object of their discourses, rather than points of faith or the dogmas of sectarianism.

Immediately on leaving the Academy, he was invited to the office of minister to the congregation of Benn's Garden, in Liverpool. In 1767 he married Mary, the only daughter of Mr. Holland, draper in Liverpool; a connexion which constituted his principal happiness for the rest of his life. In 1768 and 1770 he published two volumes of sermons, which were very favourably received. One of these volumes, now scarce, is rather remarkable for being embellished with vignette sketches illustrative of the subject of each discourse, from the pencil of Fuseli.

He took his leave of Liverpool on being invited to the office of tutor in the belles lettres and resident conductor of the discipline at the academy of Warrington. These offices he accepted in conjunction with that of minister to the dissenting congregation of Warrington. Of Dr. Enfield's qualifications for the office of tutor in the belles lettres there could be no doubt; but if, as was supposed, his mild disposition and amiable manners disqualified him for a disciplinarian, it must in justice be acknowledged that sterner deportment and stricter discipline have also failed in preserving dissenting academical institutions from the fate that has so frequently attended them. The degree of doctor of laws was obtained from Edinburgh for him and others of the tutors by the trustees of the academy.

Of Dr. Enfield's industry some idea may be formed from the following list of the works which he published during his residence at Warrington and in the midst of his other various and important occupations:—

'The Preacher's Directory,' 4to., 1771. 'The English Preacher; a Collection of Sermons abridged and selected from various Authors,' 9 vols. 12mo., 1773. 'An Essay towards the History of Liverpool, principally from the Papers of Mr. George Perry,' fol., 1774. 'Observations on Literary Property,' 4to., 1774. 'The Speaker; or Miscellaneous Pieces selected from the best English Writers, for the purposes of Reading and Speaking,' 8vo. 1774. 'Biographical Sermons on the Principal Characters of the Old and New Testament,' 12mo., 1777. 'Exercises in Elocution, being a Sequel to the Speaker,' 8vo., 1781. 'A Translation of Rosignol's Elements of Geometry,' 8vo. 'Institutes of Natural Philosophy, Theoretical and Experimental,' 4to., 1783. And besides these, various occasional sermons.

'Several of the above,' as Dr. Aikin observes, 'belong to the humble but useful class of compilations; yet in them he found occasion to display the elegance of his taste and the soundness of his judgment.' The 'Speaker' was one of the first, and is still, perhaps, one of the best selections from our English classical writers.

After the dissolution of the academy, Dr. Enfield remained two years at Warrington, occupied in the education of private pupils, and in his duties as minister of the congregation. In 1785 he accepted an invitation from the Octagon dissenting congregation at Norwich. He first settled at the village of Thorpe, where he received private pupils, and afterwards removed to Norwich, where, at length, he devoted his whole time to literary occupations and his official duties. It was during his residence at Norwich, that besides being engaged as a writer in the Monthly and Analytical Reviews, he undertook an abridgment of Brucker's 'History of Philosophy,' in 2 vols., 4to. In this task he was kindly encouraged by Dr. Bagot, at that time bishop of Norwich, and accommodated by him with books from Cambridge and from his own library.

Dr. Enfield published also while at Warrington another small volume of sermons on the principal characters of the Old and New Testament; and Dr. Aikin says, that while there he drew up a series of discourses on the principal incidents and moral precepts of the gospel, in which he displayed both his talents as a commentator and his skill in expanding into general lessons of conduct those hints and particular observations which occur in the sacred narratives. This work was not published, but a selection of twenty sermons from it forms the last of three volumes of discourses which were published after his decease by subscription for the benefit of his widow: and these productions of his maturer years will be found much superior to those sermons which were given to the world at an early period of his life. The series of discourses on the gospels was written chiefly, if not altogether, at Norwich.

Dr. Enfield was also a frequent contributor to the Monthly Magazine at its commencement, in which the papers under the title of the 'Enquirer' are mostly from his pen. His last literary undertaking was that of a General Biographical Dictionary, in conjunction with one of his oldest and most valued friends, Dr. John Aikin. He resided at Norwich till his death, which, after a short but painful illness, took place on November 3rd, 1797, in the fifty-seventh year of his age.

As a sermon-writer, Dr. Enfield obtained so great a reputation as not only to be applied to for assistance by his less industrious dissenting brethren, but also, through the agency of a London bookseller, by several of the clergy of the Establishment, for sermons on particular occasions, for which he was liberally remunerated.

As a preacher, his manner of delivery was, as Dr. Aikin characterizes it, grave and impressive, affecting rather a uniform dignity than a variety of expression. It was entirely free from what is called tone, and though not highly animated, was by no means dull, and never careless or indifferent.

As a companion, he was universally esteemed in every situation, and at every period of his life. That influential intercourse with a congregation, formerly considered a more essential part of the duty of a dissenting minister than it now is, in the case of Dr. Enfield, who never assumed the priest, had uniformly a beneficial tendency. He was one whose entrance into any society of those who knew him instantly diffused pleasure. In small parties he frequently exhibited the rare talent of good reading, and with equal effect in the humorous and the pathetic. Both at Warrington and at Norwich he was instrumental in forming societies for the free discussion of the most interesting topics, without limitation or exclusion. He thus did much towards delighting, elevating, and refining the circle in which he moved; and the mildness and amiability of his disposition and manners aided the gentle and unobtrusive influence of his benevolent heart.

ENFIELD. [Middlesex.]

ENFILADE is the denomination applied to a fire of artillery or musketry when made in the direction of the enemy's line of troops, or to that which is made from a battery to the interior of an enemy's rampart or trench, and in the direction of its length. When an artillery fire is employed by the besiegers of a fortress, the intention is to dismount the guns of the defenders; and this end it accomplishes with more certainty than if the fire were directed from the front towards the mouths of the embrasures, both because the side of a gun-carriage presents a larger surface than the muzzle of the piece to the action of the shot, and because the same shot may take effect against two or more guns placed upon the same line of rampart. An enfilading fire of artillery is also used by the besiegers to destroy the palisades or other obstacles behind a glacis, and to prevent the defenders from remaining at their parapets. When employed by the defenders of a fortress, it is intended to sweep any of the besiegers' trenches which may from necessity, or through the fault of the engineer, lie in a direction tending towards some part of the ramparts of the fortress.

The destructive effects of an enfilading fire, when directed against the guns on a rampart, are diminished by constructing traverses across the rampart at intervals, or by placing the guns in blindages. And, to avoid such fire on the trenches of the besiegers, the practice is to form those trenches in zig-zag directions, tending alternately to the right and left of the general line of the approaches, so that, if produced, they may fall on the exterior of all the ramparts from whence a fire might be directed towards the approaches: when this is not possible it becomes necessary to raise traverses in such trenches as are thus exposed to the fire.

In Sir John T. Jones's Journals of the Sieges in Spain, there is given an account of the ingenious attempt made by a French corporal to cause one of the trenches of the besiegers before Badajos to be enfiladed by the guns of the fortress: the man contrived secretly in the evening to place on the ground the tracing cord which the British engineer had stretched in order to indicate the intended direction of the trench; and the attempt only failed because the officer who came on duty for the night accidentally discovered, before darkness came on, the error in the position of the line. [Ricochet.]

ENFRANCHISEMENT. [Copyhold.]

ENGADIN, the valley of the Upper Inn in the canton of the Grisons, in Eastern Switzerland, runs from south-west to north-east, from the sources of the Inn at the [illegible] of Mount Maloya to the defile of Finstermünz, where the Inn enters the Tyrol, a length of about 50 miles. It is the largest valley in Switzerland next to the Valais, and [illegible] the finest; it lies between two massive and lofty ridges, the Rhætian Alps, both of which branch off from Mount Maloya. The northern ridge, which contains the summits known by the names of Julier (6800 feet), Albula ([illegible]), Scaletta (8000), Fluela, Piz Linnard, Selvretta, &c., divides the waters of the Inn from those of the Albula, Lanquart, and the Iller, which flow into the Rhine. The southern range consists of the Monte dell' Oro (8000 feet), the Bernina (6200), the Casanna, the Fraele, the Piz P[illegible], Sursas, Pizlat, &c., and divides the valley of the Inn from that of the Adda, called also Valtelina, and from the valley of the Upper Etsch or Adige in the Tyrol. More than twenty transverse valleys open into the longitudinal valley of Engadin. The width of the plain which forms the bottom of the valley of Engadin is from one to two miles in its widest parts, but it is much narrower in many places.

The slopes of the mountains are covered with forests and pastures. The cultivated grounds produce some barley and oats, potatoes, turnips, peas, and other vegetables. The Upper Engadin being more elevated than the lower part of the valley, has a keener air and sharper winters ser Kasthofer (*Voyage dans les petits Cantons et dans les Alpes Rhétiennes*) saw at Celerina, about 5350 feet above the sea, barley and oats, and at St. Moritz, which is about the same elevation, he saw cabbages, peas, carrots, turnips, and lettuces. Potatoes are sometimes planted in certain localities, but the barley harvest is uncertain. The Lower Engadin enjoys a milder climate; at Zernetz, 4400 feet above the sea, barley, rye, peas, potatoes, and hemp succeed; lower down the valley, flax is cultivated with success. The cherry and other fruit trees are also met with. But the chief wealth of Engadin and especially of the upper part, consists in its cattle; its cheese equals that of Gruyère, and is largely exported. Many of the men emigrate to foreign countries, especially to Lombardy and the Venetian States, where they follow the trade of pastry-cooks and confectioners. Some of them make money, with which they return home, and build fine houses, which are conspicuous objects in most of the villages. Their fields are therefore either left to the care of the women or let, and such is the scarcity of native labourers, that about 1500 hay-makers from the neighbouring countries repair to Engadin for the hay harvest, and are paid at the rate of 1½ to 2 florins a day, besides a plentiful allowance of victuals. Masons, carpenters, and smiths are mostly foreigners. Leather is imported, while a quantity of raw hides are exported. Most of the pastures on the high Alps are let to herdsmen from Bergamo and other parts of Lombardy, who migrate thither with their cattle in the summer months. These herdsmen take along with them very fierce mastiffs, which are dangerous to stray pedestrians or hunters.

The villages of Engadin are chiefly along the road which follows the course of the Inn for the whole length of the valley, and then leads into Tyrol by St. Martinsbruck, and joins the high road coming from Italy by the Stilfser Joch to Innsbruck. [BORMIO.] Several paths lead from Engadin into the other valleys of the Grisons; the principal one is over the Julier leading into the valley of the Albula and thence to Chur or Coire. Another path over the Maloya leads into the Val Bregaglia, which belongs likewise to the Grisons, and thence to the Chiavenna. Other paths lead over the southern ridge into Valtelina; the most frequented is that over the Bernina into the valley of Poschiavo, also belonging to the Grisons, and from thence to Tirano and Sondrio on the Adda. A road leads from Zernetz in Lower Engadin by the Val del Forno, and over the Buffalora mountain, 6000 feet high, into the Munster Thal, also a Grison district, bordering upon Tyrol, and which opens into the valley of the Etsch.

Upper Engadin has eleven communes or parishes, and reckons about 800 men fit to bear arms, and Lower Engadin has ten communes and 1200 men fit for military service. The whole population is estimated at about 9000, of which Lower Engadin contains 5600. Upper Engadin returns three members and Lower Engadin four to the great council or legislature of the canton. Every commune elects its municipal magistrates, and each of the two divisions of the valley has its landamman and its court of justice, the members of which are renewed every two years.

The people of Engadin are Protestants of the reformed Swiss church, with the exception of the commune of Tarasp, which is Catholic, and which belonged to the house of Austria till 1801. They speak the Ladin, a dialect of the Romansh or Romance language, which has much resemblance to the Italian. There are books printed in Ladin.

Schuols in Lower Engadin, is the largest village in the whole valley; it contains nearly 200 dwelling-houses, and a handsome parish church. Zernetz, also in Lower Engadin, has about 450 inhabitants. Samaden, which is the principal village of the Upper Engadin, has about 460 inhabitants, some fine houses, and three churches. The families of Salis and Planta, which had once very extensive feudal powers in those parts, and whose rivalry occasioned much bloodshed, are originally from Engadin, the history of which is connected with that of the Grisons' country. [GRISONS.] (Leresche, *Dictionnaire Géographique de la Suisse*, 1836; [illegible], *Lettere sulla Svizzera, Cantone dei Grigioni*.)

ENGHIEN, LOUIS ANTOINE HENRI DE BOURBON, DUKE OF, was born at Chantilly, August, 1772. He was the son of the duke of Bourbon and grandson of the prince of Condé, being a lateral branch of the then reigning family of France. After the French revolution broke out, young d'Enghien served under his grandfather in the corps of the French emigrants who fought on the Rhine. At the peace of Luneville with Austria, in 1801, the corps was disbanded, and Enghien fixed his residence at Ettenheim, a château on the German side of the Rhine, a few miles from that river, and in the territories of the margrave of Baden. An attachment between him and the princess Charlotte of Rohan, who resided at Ettenheim with her relative the Cardinal de Rohan, induced the duke to remain there. After the war had broken out again between England and France, in 1803, the English government took the French emigrants again into its pay, and they were directed to go to the German side of the Rhine to act when required. The duke of Enghien was looked upon as their head. Meantime the conspiracy of Georges and Pichegru against the person of the first consul, Bonaparte, was discovered at Paris. It has never been proved that the Duke of Enghien was privy to that conspiracy, but it is evident that he was led to expect an insurrectionary movement in France in favour of the Bourbons, of which he intended to avail himself by entering France at the head of the emigrants. This he did not deny. Bonaparte, alarmed at the conspiracy and at the avowed intention of Georges to assassinate him, seems to have persuaded himself that the Duke of Enghien was connected with the Paris conspirators, and that the whole was a plan directed by the Bourbons in England and by the English government. That all the above parties desired his overthrow is undoubted, and is no more than might be expected, as they were his declared enemies, but considerable difference may have existed as to the means which they intended to employ. Georges and his Chouan friends preferred assassination as the shortest and most congenial to their habits, but there is no evidence that they had instructions to that effect, or were countenanced in it by any of the higher parties, who really seem to have expected an insurrectionary movement in Paris, in which Moreau, Pichegru, and other influential persons would have participated. The insurrection, however, if successful, would, in all probability, have occasioned the death of Bonaparte, if not by assassination, at least in the scramble and fight which must have taken place. How far the persons engaged in or countenancing such a plot were justifiable, is a question which cannot be resolved by any code of political justice yet in existence. Bonaparte, on his part, determined upon getting rid of his enemies by summary means similar to those which they employed against him. He dispatched a party of gens d'armes, who crossed the Rhine, entered without ceremony the neutral territory of Baden, surrounded the château of Ettenheim, and took the duke of Enghien prisoner, the 15th of March, 1804. [For the following part of the transaction, see BONAPARTE.] The duke was tried before a secret court, which was evidently influenced in its decision by fear of the first consul, and whose sentence was carried into execution with a most indecent haste. The duke was found guilty of all the charges preferred against him, some of which were never proved. Even the recommendation of the court for a respite to the prisoner was overruled by Savary, who was present at the sitting as a sort of extra-judicial authority to watch over the proceedings. It was altogether a dark affair worthy of the worst times of the old monarchy. Bonaparte at the time openly avowed to the Council of State his firm purpose of making an example of the duke in order to deter the other Bourbon princes and their partizans from plotting against him in future. (Thibaudeau, *Le Consulat et l'Empire*, vol. iii. ch. 41.) And again, at St. Helena, almost at his dying hour, he took upon himself alone the whole responsibility of that deed. (*Testament de Napoléon*.) After the Restoration, Hullin, president of the court, Savary, Caulaincourt, and others who had a share in the arrest, trial, and execution of the duke, wrote each in justification or extenuation of their respective conduct. The fate of the duke of Enghien excited interest and commiseration throughout Europe; he was young, brave, amiable, and one of the most promising of the Bourbon princes.

ENGHIEN. [HAINAULT.]

ENGINEERING (from the French word *engin*) is properly the art of constructing and using engines or machines; but the term is also applied to that of executing such works as are the objects of civil and military architecture, in which machinery is in general extensively employed.

A distinction has long been made between the civil and military engineer; and since every thing relating to the service of artillery is now confided to a particular corps, the duty of the military engineer may be said to comprehend the construction of fortifications, both permanent and temporary, including the trenches and batteries required in besieging places; also of barracks, magazines, and other works connected with warlike affairs.

The profession of the civil engineer comprehends the design and execution of every great work by which commerce and the practice of the useful arts may be facilitated. Thus, in creating or improving the communications of a country, he would be called upon to form a road through hills or over valleys or rivers, or to excavate a canal in connection with the waters by which it may be supplied, and to build the locks for retaining the surface at different levels, in different places, when the inequalities of the ground are considerable. He raises embankments to resist the encroachments of the sea or to reclaim the land which it may have covered, and dams to break the force of its waves at the mouths of natural harbours. He renders rivers navigable when their course is obstructed by rocks or banks; he forms docks or artificial harbours where ships may remain in security; and he is required to penetrate by mines to vast depths for the purpose of seeking the mineral treasures contained within the bosom of the earth. Such are the occupations of this important class of men; and it is necessary to observe that they frequently, in addition, practise the avocation of the machinist in executing the presses, mills, looms, and other great machines employed in the arts and manufactures; particularly in constructing steam-engines and the apparatus by which they are rendered available for giving motion to ships, carriages, or machinery.

In France the title of engineer is extended to persons who are employed for the public service in trigonometrical surveying in the interior of a country or on the coasts, and in the practice of naval architecture. The French have thus a corps of ingénieurs géographes, of ingénieurs d'hydrographie, and of ingénieurs de marine.

Engineering must have originated with the first application of a lever for the purpose of moving a mass of any material which exerted a resistance exceeding the unassisted strength of man: by observing the effects produced in operations of that nature, the laws of the action of bodies on one another were gradually discovered, and mechanics, the science of the engineer, arose.

Archimedes, in addition to the title of geometer, may with justice claim that of mechanician; and in fact he is the first person who is known to have applied himself to the cultivation of the mixed mathematical sciences. Besides demonstrating the fundamental property of the lever, he determined the centre of gravity in bodies of certain forms, and the positions in which bodies remain in equilibrio in a fluid; and from the celebrity he acquired among the antients by the mechanical contrivances which, according to Polybius, he put in practice for the defence of Syracuse, we may conclude that if those contrivances were not his own inventions, they must have contained improvements upon such as had been in use before his time.

Vitruvius wrote his treatise on architecture during the reign, as it is generally believed, of Vespasian. In that treatise he describes the manner of building the walls and towers for fortifying towns, the construction of temples, basilicæ, theatres, and private dwellings; he describes the principal military engines which were then in use; he also gives some account of machines for drawing and raising weights, of engines for raising water, and of mills turned by water for grinding corn. The work may therefore be considered as comprehending every important object connected with engineering at the time in which he lived. Now he states, in the proem to the first book, that he had been appointed by the emperor to have the charge of the warlike engines; and in another place, that he had designed and executed a basilica at Fanum; it is evident therefore that he united in his person the character of engineer and architect; and among the antients the profession of the former seems to have been always included in that of the latter. The 'machinarius' was probably the artificer who executed the civil and military machines, or the petty officer who, at the siege of a fortress, superintended the service of the engines.

Of the national works executed by the antients, and which are to be considered as properly falling within the province of the engineer, one of the first of which we have any intimation is the canal uniting the Red Sea and the Nile, which, according to Pliny, was begun by Sesostris, or, according to Herodotus, by Necos, the son of Psammetichus, and finished by Darius the First. The canal of Xerxes across the isthmus of the peninsula of Athos is another example of works of this kind. The introduction of arches in works of magnitude may be said to have constituted an epoch in the profession of the architectural engineer, as the idea of giving to blocks of stone a form which would enable them to sustain themselves in balance, or rest by their mutual pressures, the discovery of the means of arranging them on a curve surface, and the determination of the magnitudes of the piers or abutments so that the lateral pressure of the vault might be adequately resisted, imply a higher degree of intellectual power than is exhibited in covering a space with a horizontal roof. The Cloaca Maxima [CLOACÆ] at Rome is probably the most antient example in Europe of this scientific construction; the dome of the Pantheon, and the various arches of the Thermæ and of other public buildings both at Rome and in the provinces, such as aqueducts and bridges, attest the grandeur of the design, combined with purposes of public utility, which characterized the architects who lived under the early emperors.

Vitruvius enumerates several Greeks who had written on machinery; but from his time to that in which Italy rose again to importance after the fall of the empire, little is known concerning the state of engineering in Europe. Subsequently to the last-mentioned epoch, Cardan, Guido Ubaldi, Valerius, and Galileo, in that country, and Stevinus, Huygens, and Descartes, in the north, are distinguished as cultivators of theoretical mechanics. Galileo particularly deserves to be named for his discovery of the laws of motion, his application of the pendulum to the measurement of time, and for his theory of projectiles. From his day to the present almost every distinguished mathematician, both on the continent and in this country, has contributed to the advancement of the mechanical sciences.

Previously to the commencement of the eighteenth century the most celebrated practical engineers were Brunelleschi, who built the dome of St. Mary at Florence; Peruzzi, San Gallo, and Michel Angelo, who executed that of St. Peter at Rome; San Michæli, the supposed inventor of the bastion system of fortification; and to these may be added Sir Christopher Wren, the architect of St. Paul's Cathedral in London.

In Holland and in the north of Italy the necessity of securing the low grounds against the inundations of the seas and rivers, and of obtaining an inland navigation for the purposes of commerce, gave rise to the cultivation of that branch of engineering which relates to hydraulic constructions; and the invention of the lock for canals is believed to have taken place in the former country about the middle of the thirteenth century. Indeed we find the profession practised in those countries on an extensive scale when there was not a man in England capable of undertaking the formation of a canal to drain the ground. Before the reign of Charles I. it appears to have been the practice to send to Holland for an engineer when any work of that nature was to be undertaken.

But the extension of the manufactures of this country soon after that period, and the consequent augmentation both of its internal and foreign commerce, called forth the energies of the people, who, at length, in the works performed for facilitating the means of communicating between one place and another, and in the practice of the useful arts, rose to an eminence which other nations have not been able to attain. Among the former may be mentioned the numerous canals and railways which intersect the country; the majestic bridges executed in stone over the Thames; in cast-iron over the Avon, the Thames, &c. and those on the suspension principle at the Menai and Hammersmith. And among the men to whose useful talents in this branch of engineering the nation is indebted may be named Brindley, Smeaton, Jessop, Telford, the Rennies, and Brunel.

The invention of the steam-engine, or rather its improvement in 1769, opened a new field for the talent of the engineer in the numerous uses to which the machine became applicable. Before the time of Watt it had been employed only as a pump to raise water; but this mechanician, by converting the reciprocating motion of the beam into a rotatory motion, rendered it capable, not only of replacing, with greatly augmented energy, the power of wind, water, or horses, in giving motion to machinery for the purposes required in the arts, but also of serving as a first mover for propelling vessels through water, or for drawing carriages over land.

The course of education by which a student may qualify himself to become an engineer, whether civil or military, must necessarily comprehend a greater extent both of the pure and physical sciences than would be required for a person who is to follow any other profession. It will be, perhaps for ever, a matter of opinion how much mathematics should enter into a school course of engineering; and there are, no doubt, some persons who contend that no more is required than would serve to compute the cost of materials and the wages of labour; this, and the observation of existing examples, being supposed sufficient to enable a man to enter upon the practice of the profession. It is not however with such knowledge only that an engineer is qualified to design an important work which it may be required to conduct under new and difficult circumstances. Mere science certainly cannot make a man an engineer; for analytical formulæ relating to mechanical equilibrium or operations, being necessarily founded on the erroneous assumption that materials are perfectly hard, perfectly smooth, &c., and that the actions of bodies on one another are subject to invariable laws, have no practical utility unless corrected by observation and experiment. On the other hand, mere diligence in observing the results of practical operations will never raise a man to proficiency in art unless he is gifted with very extraordinary powers. A judicious combination of theory and practice is indispensable, and such a combination can only be made by a man in whom great natural talent is blended with all the aids that the sciences can afford.

Of the military engineer it may be said that a greater knowledge of the many minute details of construction is required than would suffice to the civil practitioner; because it may happen that the former is called upon to exercise his profession in some colony where workmen adequately skilled in the mechanical operations may be wanting; the accomplishment of the work may then become impracticable, should the officer not be qualified to give the necessary instructions to those who are placed under his direction.

It is to be regretted that in the schools of this country there prevails an almost exclusive attention to the studies which may be comprehended under the general term 'literature;' and that, notwithstanding the vast importance of the sciences and arts in promoting the prosperity of the nation, there is not, if we except the military schools at Woolwich, Sandhurst, and Addiscombe, any place of education where young men are instructed in the *science of the engineer*. In a discourse delivered by M. Barnaux de Fovy, which was printed in 1796, it is stated that the pupils, on entering the Ecole du Génie at Mézières, were required to undergo an examination in arithmetic, algebra, geometry, the infinitesimal calculus, mechanics, hydraulics, and drawing. And these branches of science are said to be but the key to those taught at the institution itself, which are stereotomy (the art of representing the sections of solids), the principles of carpentry, civil and military architecture, perspective, the theory of shadows, and surveying; and with these are said to have been combined the science of military tactics and a course of chemistry. If the above branches of study were considered requisite for the Ecole du Génie, much more, omitting only that which relates to tactics, would they be proper for the civil engineer, who is called upon to design and carry into execution works of far greater complexity than those which appertain to the science of war.

It is easy to conceive that the knowledge which a boy, at the age of entering a public school, can have of the infinitesimal calculus and mechanics must be very superficial; and it would perhaps suffice if he then possessed a competent knowledge of plane geometry, trigonometry, mensuration, and common algebra. But it is correct to say that, before a youth is placed in the office of a practical engineer, his education should have comprehended most of the subjects above enumerated, particularly the principal propositions in mechanics, hydrostatics, and pneumatics; since it is scarcely probable that the means of instruction will afterwards be within his reach, even were he led by inclination to seek them.

The institution of civil engineers which was formed at London in 1828 cannot fail, by the publication of its transactions, to be the means of greatly assisting such persons as may hereafter enter the profession; and, through them, of rendering service to society itself. Even established practitioners may occasionally derive benefit from the theoretical investigations and the practical details of construction which are the subjects of the papers read at the meetings of the members.

The professions of an architect and of an engineer, as they are practised at present, may be said to coincide with one another to a certain extent. The members of both must be able to form a judgment of the quality of the ground in which the foundations of their buildings are to be laid; they must be acquainted with the capacities of different materials, wood, stone, and iron, for resisting the strains to which such materials may be exposed, so that sufficient strength may be obtained with a due attention to economy; and they must equally attend to the principles of equilibrium in their roofs, arches, and domes, arranging the beams, bars, or voussoirs so that they may remain at rest with as little strain as possible upon the connecting ties by which the joints are strengthened. But here the two professions diverge from one another; while the engineer has to determine, by a process of levelling, the profile of the ground on perhaps an extensive line of country, for a road or a canal; or has to determine the forms and dimensions of his retaining walls so that they may resist the pressure of earth or water against them; or, finally, to devise methods of rendering the action of his moving powers uniform, and of transmitting them through a train of machinery to the place where the effect is to be produced,—the architect is engaged in designing the external forms and internal arrangements of edifices, in which, whether intended as palaces or private dwellings, or as buildings consecrated to the service of religion or of the state, architectonic beauty must be combined with fitness for the purposes for which they are intended.

ENGLAND, originally *Engla-land*, *Engle-land*, and *Engle-lond*, means the land of the Angles, Aengles, or Engles. The vowel in the first syllable appears to have preserved its proper sound most completely in the French *Angleterre*. In the languages of the Teutonic family it has generally slid into the thinner sound of *E* or *Ae*, which is nearly, but not quite, the same with our English *a* in such a word as *made*. Thus the Dutch say *Engeland*, and the Germans *England*, spelling the word exactly as we do. It is to be observed, however, that in this country we have receded still farther from the original form of the word in our pronunciation than in our spelling; for both in *England* and *English*, the first syllable is pronounced as if the vowel were not *e*, but *i*. This last fact connects itself, in some way or other, with the manner in which the nations of the south of Europe both pronounce and write the word; the Italians saying *Inghilterra*, the Spaniards *Inglaterra*, and the Portuguese *Inglaterra*. But these forms may have been adopted either from an imitation of the English pronunciation, or from some tendency peculiar to the languages of the Latin family (in which case it is possible that our present pronunciation of the word may be an innovation derived, probably not longer ago than the latter part of the sixteenth century, from Spain or Italy); or the Italian, Spanish, and Portuguese forms on the one hand, and the English mode of pronouncing the word on the other, may be so many independent exemplifications of a tendency to farther and farther attenuation natural to the vowel sound in this position, the reduction from *e* to *i* being only a continuation of the process by which the broad *a* had been previously converted into *e* or *ae*.

There can be no doubt, at all events, that the meaning of the word is, as we have just explained it, the land or country of the Angles. It is usual to speak of the people who occupied the south of Britain before the Norman Conquest by the names of the Saxons or the Anglo-Saxons; but each of these appellations is apt to lead to some misapprehension. To begin with the latter: by the Anglo-Saxon people and language seem commonly to be understood the nation and language of the English Saxons, as distinguished from the Saxons of Germany; indeed the Anglo-Saxons are often called the English Saxons (for instance, in Gibson's translation of Camden's Britannia, pp. 144-163). In this sense, however, we believe, the word is altogether a modern formation. Our ancestors before the Norman Conquest did not call themselves Anglo-Saxons, as meaning the English Saxons or the Saxons of England. Asser indeed designates Alfred as Angul-Saxonum Rex; but the meaning intended to be conveyed by this awkward compound term appears to have been, not the English Saxons, but the Angles or English and the Saxons. When the Saxon part of the population alone was spoken of, they were never called the Anglo-Saxons or English Saxons, but simply the Saxons, or, as the case might be, the West or East or South Saxons. Then, secondly, with regard to the term Saxons: that name, we believe, was never used among our ancestors themselves, in the times before the Norman conquest, as applicable to the general population of South Britain: they confined it to that particular portion of the population which was of Saxon lineage, and which did not occupy half the country. It is true that foreigners did not always strictly observe this distinction, but often spoke of the whole people as Saxons, naturally misled both by the greater celebrity of that name for some ages before the settlement of the Saxons and the other kindred tribes in Britain, and by the circumstance that the first of those invaders that arrived in the country appear to have been Jutes and Saxons. We easily account in this way for the application of the term Saxons to the entire body of the new population by the Welsh writer Gildas, and for its having apparently been generally used in the same comprehensive sense both by the Welsh and the Scots of North Britain from the earliest times. The *Sassenagh* is still the name given to the English by the Scottish Highlanders and by the Welsh; and antiently the southern part of the present Scotland, which was chiefly occupied by a population of English descent, was known in the more northern parts by the name of Saxonia or Saxony. The prevalence, again, of the term Saxon in modern times, as applied to the entire population of England before the Norman Conquest, and to the language then spoken in the country, is to be attributed principally to the appropriation of the term English in another sense, namely, to the inhabitants and the language of the country since the Conquest, and also perhaps in part to the circumstance of the state which eventually obtained the general sovereignty in the times previous to the Conquest having been a Saxon state. But the name by which the entire population was commonly described in those times by natives of the country was certainly not the Saxons, but the Angles or the English; and that from the earliest date to which our evidence on the subject extends. It is commonly said that the use of the term English as the common national appellative is probably to be traced to the circumstance of Bede, himself an Angle, having entitled his history 'Historia Ecclesiastica Gentis Anglorum,' and having, in conformity with that title, applied the name Angli throughout the work as the general designation of his countrymen. But the use of the name in that comprehensive sense appears to be considerably older than the time of Bede, who died in A.D. 735. We find the Kentish king Ethelbert, considerably more than a century before this, subscribing himself to a charter 'Ego Ethelbertus, Rex Anglorum,' in virtue apparently of his dignity as Bretwalda or supreme monarch, which he held from about the year 589 till his death in 616. Taking this fact along with the other, which is unquestionable, that the kings of Wessex, after they acquired the sovereignty of the whole country, although their own state was Saxon, yet called themselves, not kings of the Saxons, but kings of the Angles and of England, we may safely conclude that the latter had all along been the names by which the whole people and country were commonly known, and that Bede in employing them as he did only followed antecedent usage. We believe the country to have been called England, and the people and their language English, from the time of the introduction of Christianity.

To the circumstances of that introduction we would trace this use of the names. The captives from Britain exposed for sale in the market-place of Rome, who first drew upon their country the attention of Gregory, afterwards pope, were Angles, as the well-known pun, 'They would be not Angles, but angels, if they were but Christians,' which the name of their nation and their fair appearance suggested to Gregory, may remind us. It was the Angles, therefore, that Gregory formed the desire of converting; and it was to the inhabitants of Britain considered as Angles that Augustine and his companions were some years afterwards sent as missionaries. These circumstances were enough to fix the name as the proper Christian appellation of the nation. It was that by which the people had been known to the missionaries before their arrival among them, and which the anecdote of Gregory would doubtless endear to these holy men and to their disciples. Hence its assumption by their royal convert Ethelbert, taking, in his quality of supreme monarch, the title of Rex Anglorum, as already noticed. It was of course also the most appropriate appellation which Bede, writing the history of the church thus planted, could employ. And although we cannot suppose that he was the first who so applied it, the constant use of it in his great work may be reasonably supposed to have had much effect in establishing its acceptation in the sense in which it has been there employed. In this way the terms England and English very soon came into universal use as the proper names of the country, the people, and the language, just as they are at this day.

According to the statement of Bede, which, repeated in the Saxon Chronicle, is the only distinct account we possess of the invaders from the Continent who effected the conquest of South Britain in the fifth and sixth centuries, they consisted principally of three nations or tribes, the Jutes, the Saxons, and the Angles. (*Hist. Eccles.* i. 15.) In another place, however (v. 10), he mentions Frisians as being mixed with these; and there are other antient testimonies to the same effect, especially a remarkable passage in Procopius (*Bell. Goth.* iv. 20), where, in his account of the island under the name of Brittia, he describes it as inhabited by three nations, the Angles, the Frisones, and those of the same name with the island, the Britons (Ἄγγιλοί τε καὶ Φρίσσονες καὶ οἱ τῇ νήσῳ ὁμώνυμοι Βρίττονες), each of which nations had a king. Sir Francis Palgrave (*Rise and Progress of the Eng. Com.*, pp. 41, 42) considers the name Frisians in this passage to include both the Jutes and the Angles, as well as the Frisians proper, all these apparently being alike Belgic tribes. 'By the Frisians,' he adds, 'Hengist is deemed to be a Frisian king; and the legend of Rowena, or, as they term her, Ronix, is incorporated in their history. A better proof of affinity is to be found in the resemblance of the Frisic and Anglo-Saxon languages, which in many instances amounts to an absolute identity. But the most conclusive argument of the unity of the nations is deduced from the judgments dictated by Wulemar, and incorporated in their respective laws of the Frisians and Angles, showing thereby that they obeyed the dictates of a common legislator.' It is to be recollected, that antiently the Frisians appear to have been spread, in detached settlements, along the whole line of the coast from the Schelde to the North Sea. Down to the eighth century, what was called the Greater Friesland (or Frisia Major), then forming part of the empire of Charlemagne, extended all the way from the Schelde to the Weser. But the Frisians who passed over into Britain with the Saxons, Angles, and Jutes, were most probably the Strandfrisii, or inhabitants of the small district called the Lesser Friesland (Frisia Minor), lying opposite to the isle of Northstrand, on the western coast of Schleswig. (See further upon this subject Usher, *Antiq. Eccles. Brit.*, p. 397; and Turner, *Hist. Ang. Sax.* i. 3[illegible])

We may here observe that, although it has been commonly assumed that our present Teutonic speech was brought over by these Saxons, Angles, and other kindred tribes in the fifth and sixth centuries, there are not wanting some writers who contend that it has been known in the island from a much earlier date. Sir John Clerk of Pennicuick was, as far as we are aware, the first who advanced the opinion that the Belgic tribes who, according to Cæsar, occupied the whole or the greater part of the southern coast before the arrival of the Romans, spoke, not a Celtic, but a Teutonic dialect; in other words, a language radically the same with that brought over many ages afterwards by the Angles and Saxons. His 'Dissertation on the Antient Language of Britain,' although written forty years before, was not published till 1782, when it appeared in the [illegible] volume of the 'Bibliotheca Topographica Britannica,' at London. Pinkerton, in his 'Inquiry into the History of Scotland' (first published in 1789), claims the credit of having made the same discovery two years before he saw Sir J. Clerk's Dissertation. 'It is one,' he observes, 'which in the history of no other country would have been reserved for this century, and which I will venture to say is more important to English history than any yet made, or that can be made. For it not only adds seven centuries to the history of Englishmen, as such, but will, if duly attended to, put the whole history of law, manners, antiquities, &c. in England, upon quite a new and far more interesting footing.' Sir Francis Palgrave, in his work quoted above, also inclines to the presumption that 'a dialect closely allied to the Anglo-Saxon was spoken in Britain long before the arrival of the last invaders' (p. 27). This supposition certainly would enable us to explain some difficulties not otherwise to be easily got over, especially the remarkable fact that, while the old inhabitants cannot be believed to have been wholly swept from the soil by their invaders and conquerors, but were most probably retained in great numbers as slaves, both domestic and predial, no hint or indication is to be found of any distinction of language having existed between the two races that were thus associated.

The first of the Germanic invaders that arrived after the departure of the Romans are described as having been a body of Jutes, under two leaders named Hengist and Horsa. They arrived A.D. 449 at Ebbsfleet, now an inland spot, but then on the coast of the Isle of Thanet, and near the mouth of the Wantsum, now a mere rivulet, which divides Thanet from the rest of Kent. The name of the Jutes is variously written Jutae, Juitae, Jotuni, Geatani, Gietae, Getae, Jetae, &c. It is probably the same name with Getae, and that again is probably identical with Gothi, Scythae, and Scuti. (See upon this subject Pinkerton's *Dissertation on the Scythians or Goths*, chap. i.) The Jutes who came to Britain with Hengist and Horsa, however, appear to have come immediately from what was formerly called South Jutland, and is now the duchy of Schleswig. They were probably, therefore, in part at least, from the district called the Lesser Friesland, which, as already mentioned, was situated on the coast of South Jutland. The Jutes, according to Bede, were the ancestors of the people of Kent, and also of the inhabitants of the Isle of Wight, and of the part of the coast of Hampshire opposite to it; that is to say, the Jutes settled in those parts, mixing most probably with the former inhabitants.

The Jutes under Hengist and Horsa were followed in A.D. 477 by a body of Saxons under Ella, who made their descent on the coast of Sussex. The next leader that arrived was Cerdic, with another colony of Saxons, in A.D. 495. He probably landed somewhere on the south coast, perhaps at Southampton, although one account makes Yarmouth (in Norfolk) to have been the place. The general history of the Saxons, of which their connection with Britain forms only a very small portion, will be treated of in another article. At this period the name, in its most comprehensive acceptation, appears to have been used as that, not of one nation, but of a great confederacy of nations, the territories occupied by which extended from the Baltic far into the interior of Germany. We are inclined however to derive the Saxon invaders of Britain from the immediate vicinity of the Baltic, most probably from the country now forming the duchy of Holstein, with perhaps part of the north of Hanover, or the west of Mecklenburg. Thus situated, they would be the next neighbours of the Jutes and the Angles. And this appears to be the district which their English descendants recognised as the country of their ancestors, or the land, as they called it, of the Old Saxons, as we may learn from the account of Germany which Alfred has inserted in his translation of the Geography of Orosius. The 'Eald Seaxan' are here described as lying to the north of the Thyringas (or Thuringians); to the south-east of the Frisans (this must mean the Strandfrisians); to the east of the mouth of the Aelfe (the Elbe) and Frysland; and to the south-west of Angle and Sillende (Zealand), and part of Dena (Denmark). Bede expressly brings the English Saxons from 'the land now called the country of the Old Saxons.' They appear to have eventually occupied Sussex, Essex, Middlesex, the south part of Hertford, Surrey, Hampshire (with the exception of the coast opposite to the Isle of Wight), Berks, Wilts, Dorset, Somerset, Devon, and part of Cornwall.

It was not till the year 527 that the first Angles arrived. From that time they made a succession of descents under various petty chiefs, whose names have not been preserved, upon the coasts of Suffolk and Norfolk. In 547, however, a much more numerous body of them than had yet appeared landed under the conduct of Ida on the coast between the Tweed and the Forth, and eventually established themselves in the country to the north of the Humber. Tacitus, who in his 'Germany' has mentioned neither the Saxons nor the Jutes, merely notices the Angli along with several other tribes as lying beyond the Longobardi, and surrounded by the natural protection of their rivers and woods. As far however as anything can be made of his vague account, he appears to place them somewhere in the peninsula of Jutland. This is the situation which is assigned to them both by Bede and other antient English writers. 'From the Angles,' says Bede, 'that is to say, from the country called Anglia, and which from that time till now is said to have remained waste, between the provinces of the Jutes and the old Saxons, descended the East Angles, the Mercians, the race of the Northumbrians, and all the rest of the nations of England.' Alfred, in his 'Orosius,' also places the Angles in the Danish countries on the Baltic. And Ethelwerd, a writer of the eleventh century, describes Old Anglia as situated between the Saxons and the Jutes, and as having the city of Schleswig for its capital. This account is adopted by Camden. 'Seeing,' he observes, 'that between Jutland and Holsatia or Holstein (the antient seat of the Saxons) there is a small province in the kingdom of Denmark, under the city of Flensburg, called at this day Angel, which Lindebergius in his Epistles terms Little England, I am pretty well assured that I have found the antient seat of our forefathers, and that from this very place the Angles came into our island.' (*Brit. Introd.*) This district of Angel, or Angeln, is thus described by Dr. Edward Clarke in his 'Travels,' part iii. 4to., Lon. 1819:—'It is called Angeln,' he says, 'but this word is pronounced exactly as we pronounce England, or Engeland' (This is not very intelligible). 'We were surprised at the number of English faces we met, and resemblance is not confined to features. Many articles of dress, and many customs, are common to the two countries. The method of cultivating and dividing the land is the same in both; the meadows bounded by quickset hedges, or by fences made of intertwisted boughs, reminded us of Kent, Surrey, and Sussex. The natural appearance of the country is also like the south of England, being diversified by numerous hills and valleys, adorned with flourishing woods and fertile fields.' Angeln, however, is not, as Dr. Clarke calls it, 'the part of the duchy of Sleswick which a traveller must pass in his route from Flensburgh to Apenrade.' It lies all to the south of Flensburg. [ANGELN.] The Angles obtained possession of the whole of what is now called England, with the exception of the parts already mentioned as occupied by the Jutes and Saxons; in other words, of all England to the north of the Bristol Avon and the Thames, except the present counties of Essex, Middlesex, and part of Hertford. They also extended their settlements over a great part of the south of Scotland.

The following were the kingdoms founded by the several invading bands, the dates being those assigned in the valuable summaries of Anglo-Saxon history, given by Sir F. Palgrave in his Appendix of *Proofs and Illustrations* to his *Rise and Progress of the English Commonwealth*, p. cccxxix—cccxl:—

1. Kent, consisting of the present county of that name, founded by Hengist and Horsa, whose followers were Jutes, A.D. 457. From Æsc or Eric, the son and successor of Hengist, the kings of Kent acquired the name of *Æscingas*. Kent subsisted as an independent state till its conquest by Cenwulf, king of Mercia, in 796. In 823 it was finally annexed to Wessex by Egbert; but for at least a century after that date it is still mentioned as a separate though subordinate kingdom.

2. Sussex, consisting of the present county of that name, founded by Ella, whose followers were Saxons, A.D. 491. In A.D. 686 it was conquered by Ceadwalla, king of Wessex, and appears to have remained ever after in subjection either to that state or to Mercia. In 825 it finally submitted to Egbert; and 'from this period,' says Sir F. Palgrave, 'Sussex and Surrey appear to have been considered as integral portions of the empire of Wessex, but as annexed to the kingdom of Kent and passing with it.'

3. Wessex, including (in its greatest extent) Surrey, Hants with the Isle of Wight, Berks, Wilts, Dorset, Somerset, Devon, and part of Cornwall, founded by Cerdic and his son Cynric, whose followers were Saxons, A.D. 519. The Jutes of the Isle of Wight were conquered by Cerdic and Cynric, A.D. 530; but in 661 the island was wrested from Wessex by Wulfere, king of Mercia; some time after which it appears to have asserted its independence, which it maintained under kings of its own till the beginning of the 10th century, when it submitted to Edward the Elder. In the reign of Egbert (A.D. 800—836) the kingdom of Wessex attained a supremacy over the other states, which it never lost afterwards. [EGBERT.]

4. Essex, including the present counties of Essex and Middlesex, and the southern part of Hertfordshire, supposed to have been founded by Æsewin, or Erconwine, whose followers were Saxons, A.D. 527. 'It is doubtful,' says Sir F. Palgrave, 'whether this monarchy ever enjoyed independence.' It certainly became subject to Mercia in

the course of the seventh century, and in 823 it finally submitted to Egbert of Wessex.

5. Northumbria, consisting of the sometimes separate but commonly united states of Bernicia and Deira; the former (from the native name Bryneich) including the county of Northumberland, and the south-eastern counties of Scotland as far as the Forth, founded by Ida, whose followers were Angles, A.D. 547; the latter (from the native name Deifyr) including the counties of Cumberland, Durham, Westmoreland, York, and Lancaster, founded by Ella, whose followers were also Angles, A.D. 560. These two states appear to have coalesced before the beginning of the seventh century; and after the year 655 they were never separated, so long as they retained their independence. The limits of the kingdom of Northumbria to the north varied greatly from time to time according to the fortunes of the almost constant warfare which it carried on with the Scots, the Picts, and the kingdom of Strathclyde. From the middle of the eighth century the history of Northumbria consists of little else than a detail of civil dissensions, confusion, and bloodshed, arising from the claims of rival competitors for the throne. The Northumbrians made a formal submission to Egbert of Wessex in 829. In 867 the country was conquered by the Danes; and from this time it may be considered to have remained independent under princes of Danish race till 924, when both the Danes and the English inhabitants acknowledged the supremacy of Edward the Elder. Northumbria, however, continued to be governed by princes of its own, who, although nominally subject to the English monarch, took the title of kings, till 952. After this its rulers were only designated earls; the district forming sometimes one earldom, sometimes two, under the names of Bernicia and Deira, or Northumbria and York. It was not till some time after the Norman conquest that the territories which had formed this Saxon state came to be considered as strictly included within the realm of England.

6. East Anglia, including Norfolk, Suffolk, Cambridge, and part of Bedfordshire, founded by Uffa, whose followers were Angles, and from whom the kings of this state took the name of Uffingas, A.D. 571. The East Angles placed themselves under the sovereignty of Egbert of Wessex about the year 823, but they continued for some time after this under the immediate government of their own kings. The country was conquered by the Danes in 883; and it was not completely brought back under subjection to the English crown till after the accession of Athelstane in 925. From this time it appears to have been governed by ealdermen or dukes.

7. Mercia, including the counties of Chester, Derby, Nottingham, Lincoln, Shropshire, Stafford, Leicester, Rutland, Northampton, Huntingdon, Hereford, Worcester, Warwick, Gloucester, Oxford, Buckingham, and parts of Hertford and Bedford, said to have been founded by Crida, whose followers were Angles, A.D. 585. The name Mercia has been derived, by Camden and others, from the word mearc, a limit; 'for the other kingdoms,' it is said, 'bordered upon it.' Lingard thinks that the people were called Mercians, 'perhaps from the marshy district in which they first settled.' The most probable explanation, however, appears to be that given by Macpherson, in his 'Annals of Commerce,' who observes that the Saxon name *Myrcnaric* properly signifies the woodland kingdom, 'which,' he adds, 'agrees very closely with *Coitani*, the Latinized name of the old British inhabitants, signifying woodland-men, or foresters.' About the middle of the seventh century Mercia was conquered by Oswio, king of Northumbria; but after a few years it recovered its independence; and before the end of the next century it had reduced to subjection both the neighbouring states of East Anglia and Kent. It was eventually subjugated however about the year 825, by Egbert of Wessex, and although for some time considered as a separate kingdom, it continued ever after dependent upon that state, with the exception of a short period in the latter part of that century, during which it was overrun and taken possession of by the Danes.

This assemblage of states has been commonly called the Heptarchy, for which Mr. Turner has proposed to substitute the Octarchy, on the ground that Deira and Bernicia ought to be considered as two distinct kingdoms. But in truth it may be doubted if there ever was a time when so many as seven of the states co-existed separately and independently. Various small districts also appear to have for longer or shorter periods preserved an all but nominal independence in the midst of the larger states, to some one or other of which they were severally considered as annexed. Such were the Isle of Wight; the Suthrige, or Southern Kingdom, now Surrey; the district of Hwiccas, or Magesettam, which was conterminous with the antient bishopric of Worcester; and others, of which the annals have been for the first time collected by Sir Francis Palgrave. But above all it would be difficult to show that either term is perfectly admissible, if it be intended to imply (as in strict propriety both heptarchy and octarchy would seem to do) that the several states were all connected together into any sort of union or confederacy; that they formed, in fact, any political system entitled to be designated by one word at all. We know that they were constantly at war with one another, and of the existence of any general controlling authority, except such as one king was occasionally enabled to maintain over the rest by his sword, their history affords no trace. To certain of the kings however by whom this temporary supremacy appears to have been asserted in the most marked manner, Bede, and after him, the Saxon Chronicle, have attributed the title of Bretwalda, that is, as it has been interpreted, Wielder or Emperor of Britain; and it is probable that a species of superior honour and dignity, such as this title would imply, may have been claimed by the princes in question, and accorded to them by those of their neighbours whom they had brought under subjection, or who, although unsubdued, preferred not to provoke their enmity. The following is the succession of the Bretwaldas as given by Bede:—1. Ella, or Aelli, who was king of Sussex from 491 to 518; 2. Coelin, or Ceawlin, who reigned in Wessex from 560 to 591, and is supposed to have held the place of Bretwalda from 568 to 589; 3. Ethilbert, or Aedilberct, who was king of Kent before 568, and is supposed to have been acknowledged as Bretwalda from 589 till his death in 616; 4. Redwald, king of East Anglia, from 616 to 624; 5. Edwin, of Northumbria, from 624 to 633; 6. Oswald, of Northumbria, from 635 to 642; 7. Oswio, of Northumbria, from 642 to 670. Egbert of Wessex is reckoned the eighth Bretwalda, and is considered to have attained the dignity in the year 827. This account, it will be observed, makes the country to have been without any general sovereign for about one half of the whole period that elapsed between the death of Ella and the accession of Egbert. The enumeration also omits some kings, such as Ina of Wessex, and Offa of Mercia, who were certainly possessed of as much power as any of those, excepting Egbert, upon whom the title of Bretwalda is bestowed.

Upon the whole, the title of Bretwalda cannot well be regarded as any thing more than an ostentatious and empty assumption of some of the Saxon kings, or an epithet of distinction bestowed upon them by the flattery of the chroniclers. It certainly carried with it no real or legal authority. In the same manner we may dismiss the vaunting claims put forward by or for the Saxon Bretwaldas to the sovereignty of the Scots, the Picts, the Irish, and all the nations of other lineage inhabiting the British islands, founded as they are on little else than the interpretation put upon this title.

Lists of the kings of the several states of the heptarchy do not exist in a complete form. The most perfect that have been compiled are those published by Sir Francis Palgrave, which are stated to have been examined and verified by Mr. Allen. The more remarkable names are noticed in this Cyclopædia in separate articles.

Egbert of Wessex, although not strictly entitled to be called the first king of all England, certainly laid the foundation of what afterwards became the English monarchy. The royal house of Wessex never lost the ascendancy which he acquired for it so long as the Anglo-Saxons remained masters of England. It will be convenient therefore to begin from him the chronological table of the kings of the country, which is all that we shall now add, an account of the events of each reign from this period being given in separate articles.

Kings of Wessex, with which Kent, Essex, and Sussex were sometimes incorporated, sometimes connected as vassal states, and to which also East Anglia, Mercia, and Northumbria acknowledged a more qualified subordination:—

A.D. 800. Egbert, acknowledged as Bretwalda from A.D. 827.
836. Ethelwulf;—with Athelstane till 852, and then Ethelbert, in Kent, Essex, and Sussex.

A.D. 855. Ethelbald—with Ethelwulf (the preceding king) as supreme till 858, and Ethelbert as subordinate, in Kent, Essex, and Sussex.
860. Ethelbert.
866. Ethered, or Ethelred I.
871. Alfred the Great.
901. Edward the Elder.

Kings of all England, of the House of Wessex:—

925. Athelstane.
941. Edmund I.
946. Edred.
955. Edwy.
959. Edgar.
975. Edward the Martyr.
978. Ethelred the Unready.
1016. Edmund Ironside.

Danish Kings of England:—

1017. Canute the Great.
1035. Hardacnute, or Hardicanute, with Harold Harefoot in Mercia and Northumbria.
1037. Harold Harefoot.
1040. Hardacnute restored.

House of Wessex restored:—

1042. Edward the Confessor.

Line of the Earls of Kent, &c.:—

1066. Harold II.

Norman Line:—

1066. William the Conqueror.
1087. William Rufus.
1100. Henry I.
1135. Stephen.

Line of Plantagenet:—

1154. Henry II.
1189. Richard I.
1199. John.
1216. Henry III.
1272. Edward I.
1307. Edward II.
1327. Edward III.
1377. Richard II.

House of Lancaster:—

1399. Henry IV.
1413. Henry V.
1422. Henry VI.

House of York:—

1461. Edward IV.
1483. Edward V.
1483. Richard III.

House of Tudor:—

1485. Henry VII.
1509. Henry VIII.
1547. Edward VI.
1553. Jane Grey.
1553. Mary.
1558. Elizabeth.

House of Stewart:—

1603. James I.
1625. Charles I.

Commonwealth, from the execution of Charles I. in 1649:—

1653. Oliver Cromwell, Protector.
1658. Richard Cromwell, do.

House of Stewart restored:—

1660. Charles II.
1685. James II.

House of Orange:—

1689. William III., with Mary II. till 1695.

House of Stewart restored:—

1702. Anne.

House of Hanover:—

1714. George I.
1727. George II.
1760. George III.
1820. George IV.
1830. William IV.
1837. Victoria.

ENGLAND. The general description of this part of the island is under the head of GREAT BRITAIN, and that of Roman Britain under the head of BRITANNIA.

ENGLAND, NEW, is a name which, in the seventeenth and eighteenth centuries, was applied to the English settlements on the eastern coast of North America, north of 41° N. lat. But as, in the progress of colonization, the British population increased, the country was divided into several provinces, which, at the time when these countries acquired their independence, were formed into as many states. The provinces formerly comprehended under the name of New England were the present states of New Hampshire, Massachusetts, Rhode Island, and Connecticut; but the states of Maine and Vermont, which, before the revolution, did not form provinces, were also considered as portions of New England, though some later writers think that the state of Vermont never belonged to it. At present the term New England is rarely used.

ENGLISH ARCHITECTURE. [GOTHIC ARCHITECTURE.]

ENGLISH CHANNEL, called by the French La Manche, is that narrow sea which separates the southern shores of England from the northern shores of France. On the west it opens into the Atlantic Ocean by a wide mouth, between the Land's End and the French island of Ushant (Ouessant), where it is about 100 English miles across. On the east it is united to the North Sea by the Straits of Dover (Pas de Calais of the French). This strait, which must be considered as a part of the channel, is formed on the English side by the shore between the South Foreland and Folkstone, and on the French side by that between the harbour of Calais and Cape Grisnez, and at its narrowest point between Folkstone and Cape Grisnez is only about 20 English miles across, and at other points very little more. West of the strait of Dover, the channel rapidly increases in width; between Brighton and Havre it is more than 80 English miles across. Farther west however it is narrowed by the peninsula of Cotentin, which projects from the French coast into the channel, and terminates in Cape de la Hogue, its most north-western point. Between St. Catherine's Point on the Isle of Wight and Cape Barfleur, the eastern termination of the peninsula of Cotentin, the shores of both countries are hardly 70 miles from one another. West of the peninsula is the widest part of the channel, which between St. Alban's Head in Dorsetshire and the harbour of St. Malo is nearly 140 English miles across. The remainder of the channel to its junction with the Atlantic is between 100 and 110 miles wide.

Though there is no perceptible current in any part of the channel, it can hardly be questioned that a current generally, if not constantly, is running up it from the west. This is evident from the eastern tides being stronger than the western or ebb tides, and their running longer in stormy weather from the west. It is also observed, that at the same time the surface of the channel is raised two feet or more above that of the North Sea, and consequently discharges a great quantity of water into that sea. The ports of the channel are some feet deeper in strong westerly winds than at ordinary times. It is worthy of remark, that the French ports along the channel are shallow, and that none of them are deep enough to admit men-of-war, while England has some of its finest harbours on the coast line of the channel. As this circumstance secures to England a great advantage over France in time of war, the French government at different times have been at great expense in attempting to deepen the harbour of Cherbourg, but hitherto they have not succeeded, the works being in a short period again filled up with sand. It is not improbable that this is owing to the current, as the coast of France does not lie parallel to it, like the shores of England, but meets it in an oblique line. The channel is well stocked with fish, which gives constant occupation to a considerable number of fishermen on the coasts of England and France; the most important branch is the fishery of pilchards along the coast of Cornwall and Devonshire.

ENGLISH DRAMA. Under the head DRAMA the reader will find the history of the Greek and Roman, or what is commonly called the Antient Drama. Under the present title we have placed the History of the Modern Drama in Europe, distributed under the following heads:—

1. Italian. 2. Spanish. 3. French. 4. German. 5. English.

ITALIAN DRAMA.

After the long sleep of the true dramatic and theatrical spirit in the middle ages, which began to dawn again in mysteries and moralities independent of classical models, the first endeavour to imitate the antients in their theatre, as in other departments of art and poetry, was made by the Italians. Nevertheless, apart from the religious plays, we find in the earliest dramatic attempts of modern Italy upon secular subjects a thorough independence of the classical rules. Among these first essays we find the 'Philodoxeos, o l' Amico della Gloria' of Leon Battista Alberti; and others might be cited which, written first in Latin and afterwards in Italian, combined in like manner all the elements of tragedy, comedy, and pastoral. For although, for instance, 'L'Orfeo' of Politian, performed at Mantua, and 'Il Cefalo, o L'Aurora' of Niccolò da Correggio at Ferrara, were given under the name of pastorals, while, on the other hand, a certain Antonio da Pistoja gave that of tragedies to two dramas of his entitled 'Il Filostrato e Panfila' and 'Il Demetrio,' yet these designations were determined merely by the predominance of particular elements in the respective pieces, and not at all by adherence to or regard for the strictly classical system of keeping those elements as much as possible apart. In this respect, whatever their rudeness, these pieces were the native growth of their age and country, appearing among the numberless proofs that the marked separation between tragedy and comedy which existed in the antient theatre had no foundation in the essence of human nature and human life, but resulted from the peculiar social and religious circumstances of the people amongst whom it arose, together with the distinction and opposition in spirit and qualifications which existed among their most powerful dramatic writers.

The first specimen of the Grecian or Greco-Roman comedy that was presented to the Italians in their own language was a translation, by Collenuccio, of the 'Amphitryo' of Plautus; and soon after, Bojardo brought upon the stage 'Il Timone Misantropo.' This was about the commencement of the sixteenth century; and in 1529 was performed at Bologna, in the presence of the Emperor Charles V. and Pope Pius VII., 'The Three Tyrants' (I Tre Tiranni) of Agostino Ricchi, a piece which, though in itself original and ingenious, is now chiefly worthy of notice as marking the commencement of the long war between the *classic* and the *romantic* species. This author not only disregards the Aristotelic *unities* in the construction of his piece, but states his reasons for doing so, urging that, as the laws, customs, and manners of his own time were so different from those of antiquity, it was necessary for the moderns to pursue a different plan in the dramatic art; and to give the announcement of this principle the greater authority, he makes Mercury himself deliver it in the prologue. Sound and reasonable, however, as this doctrine is, it could not at first prevail against the countenance which the opposite system derived from the ablest writers of the period, inveterately prepossessed as they were by their sedulous study of the antique *forms* as well as spirit. Already the first example of a *regular* modern tragedy had been given in the 'Sophonisba' of Trissino, a piece not otherwise remarkable; and now Ariosto, Bibbiena, and Macchiavelli appeared as the first distinguished cultivators of the classic comedy. Of these, Ariosto was the closest imitator of the antients; while yet very young he wrote in prose, as a kind of exercise, 'La Cassaria' and 'I Suppositi;' and, pleased with these first essays, he next wrote 'La Lena,' 'Il Negromante,' and 'La Scolastica,' in 'versi sdruccioli,' a kind of verse in which he satisfied himself so well that he re-wrote in it his two former pieces. These productions are full of that spirit at once keen and polished for which their author was so distinguished; and though under the necessity of respecting the prejudices of the petty court of Ferrara, to which he was attached, yet he spares neither the lawyers and magistrates of the country, nor those other characters, much more powerful in those days, the astrologers, the courtiers, and the ecclesiastics; he was the first who ventured to exhibit on the stage a Dominican friar in the character of an inquisitor, which he did in 'La Scolastica' abovementioned. Bernardo Divizio da Bibbiena, confidential secretary to Pope Leo X., and afterwards cardinal, showed a more decided originality in 'La Calandria,' though it was partly modelled after the 'Menæchmi' of Plautus. This piece, indeed, may be considered as the most faithful mirror of the court of Rome at that remarkable period: amidst the extreme liberty of manners which prevailed in that court, for whose entertainment 'La Calandria' seems chiefly to have been written, we find frequent indications of a certain philosophic spirit which it would be vain to seek there in later times. Bibbiena seems to have aimed at nothing beyond amusement; but Macchiavelli, whose historical and political writings exhibit so forcibly the characteristic Florentine acuteness, betrays, in his 'Mandragola,' a deeper intention. In the person of Fra Timoteo, in this piece, who most conscientiously panders to the vicious appetites of an individual to promote the interests of his convent, the author has given a most humorous and piquant exhibition of the *fratismo*, or monkish domination, which degraded the society of his time: it was nevertheless acted with applause before the indulgent eyes of Leo X. and his cardinals.

The comedies of these three distinguished writers all appearing near the commencement of the sixteenth century, while no other nation had anything of equal merit to oppose to them, made such an impression that all the best writers zealously strove to follow their dramatic system. Although, in the political divisions of Italy, the influence of Spain was becoming predominant, the Spanish plays, composed on the opposite system, had not yet exhibited that strength and fire of genius which afterwards gave the Spanish theatre so powerful an influence upon the dramatic literature of Europe; so that the Italians still adhered closely to the antique models. In this kind of secondhand imitation of the antients, the Florentines most distinguished themselves by a certain subtle grace of dialogue derived from the richness of their idiom and their proverbial expressions. Among the comic writers of Florence, Aretino is certainly not to be cited for elegance and correctness, but he surpassed all the others in licentiousness and causticity. These qualities he displays yet more strikingly in his comedies than in his prose writings; and in that respect approaches perhaps, of all the moderns, the nearest to Aristophanes, attacking all ranks and all institutions. The school of Aretino had many disciples; countenanced by the example of the court of Leo, it established itself more especially in Venice, where liberty was rapidly being corrupted into licentiousness. Lodovico Dolce, indeed, the most distinguished follower of Aretino, strove to justify this unbounded license on the ground, certainly not altogether fallacious, that there was no other possible way of delineating the manners of the time. Some, however, there were, who, scandalized at the excessive liberty of the comic poets, strove to reclaim them by example to a more moderate and decent course; but these efforts, wanting comic power, only served to raise a belief that the true comic spirit was inconsistent with all moral restraint, and so confirmed the evil instead of remedying it.

Among the successful comic poets of this period, the most distinguished was Giambattista de la Porta, who flourished at the close of the sixteenth century and the beginning of the seventeenth. He was a Neapolitan gentleman with a truly encyclopædic genius, who from the deepest scientific studies could pass to the lightest amusements of literature. After forming among his countrymen the first academy of experimental philosophy, he pleased himself with instructing a company of amateur performers in the comic art, and producing a number of comedies for exhibition at his own house. Though he drew both the subjects and the form from the same source as his predecessors, yet he displayed so much happy invention in the contrivance and conduct of his pieces as to give them an air of considerable originality. Though most of his comedies were of the familiar species, and some of them even bordered on farce, yet a few rose to the noble and pathetic tone: of the latter kind are 'La Furiosa,' 'La Cintia,' 'Le Due Fratelli Rivali,' 'La Sorella,' and 'Il Moro.'

But the Italian public were satiated by such an accumulation of these regular productions. The Spanish theatre was now approaching the meridian of its glory; and the political influence of Spain on the Italian territory, being now at its height, greatly favoured the introduction of the Spanish taste in dramatic composition. These circumstances gave birth to such pieces as 'La Donna Costante,' and 'L'Amante Furioso' of Raffaele Borghini, 'L'Erofilomachia,' 'La Prigione d'Amore,' and 'I Morti Vivi' of Sforza d'Oddi, the very titles of which indicate the school to which they belong; and in which the imaginations of the zealous followers of the classic school were horrified by such incidents as that of a young lady suffering herself to be burnt alive as her only means of avoiding a hateful marriage, and that of an unfortunate lover letting himself be carried as a thief to the gallows, having no other way to preserve his mistress's honour. It does, indeed, appear that the new endeavours at this period to introduce the Spanish taste went directly over from the one extreme to the other, proceeding, not so much according to higher and freer views of dramatic art itself than had hitherto prevailed on the Italian stage, as on the erroneous principle which has been too often acted on in similar cases, that what was farthest from the old system in every respect must be the best. It was probably the first extravagances of this dramatic innovation that induced Tasso, in his latter days, to compose, as a burlesque of the new romantic taste, a play entitled 'Love's Intrigues' (Gl' Intrichi d'Amore), which was acted in [illegible] and printed in 1604. The matter of this piece well corresponds with its title; for so prodigious a number of wonderful intrigues are accumulated in it that it is not so much a comedy as a whole bundle of comedies all rolled up in five acts. Some years after, a yet more open attack was made upon the romanticists by Scipione Errico of Messina of a comedy which he entitled 'The Revolt of Parnassus' (La Rivolta di Parnaso) wherein, with little comic force, he not only introduces Trissino, Ariosto, and Tasso as rival suitors of Marini to the muse Calliope, but also, to little purpose, arrays Trajano Boccalini, Cesare Caporali, Petrarch, Bernardo, Dante, and Homer himself, in his classic phalanx.

We find a curious evidence of the transitional state of the public taste at this time in the productions of a poet of high name who thought fit to try his powers in each of the rival species. This was Michel Angelo Buonarroti the younger, nephew of the great Michel Angelo, who composed two comedies of totally different characters, entitled 'La Tancia' and 'La Fiera.' In the former he adhered closely to the classic rules. It is one of the class of pieces much in vogue at that time, and denominated *rusticali*, wherein the characters were made to speak in the dialect peculiar to that part of Italy to which they belonged; and sometimes in the same piece persons were introduced from different provinces, talking a diversity of dialects, as the Venetian, the Paduan, the Bergamask, the Milanese, &c. The most distinguished productions in this species were, the 'La Tancia' of Buonarroti and the 'Rosa' of Cesare Cortese, a Neapolitan, the latter displaying the characteristic diction of the Neapolitan people, as the former did that of the Florentines. The other production of Buonarroti, 'The Fair' (La Fiera), is a remarkable work, the very conception of which implies a total departure from the classical restrictions. The author, passionately fond of his native language, was desirous of exhibiting a full development of its resources as applicable to all ranks and professions. He therefore chose for his subject a fair, wherein most of the occupations, transactions, and occurrences of human life would be conveniently exhibited. Here each class of society appears in succession, and the author has ample opportunity to display the riches of his mother tongue in assigning to each one its peculiar diction. To execute such a design, it was necessary not only to multiply incident, action, and character, but also to vary the scene, and extend the time beyond the narrow space of a single day. No unity, in short, was here admissible, beyond that of the one magistrate who superintends all the transactions of the fair. The whole composition forms a connected series of five plays, of five acts each, which were actually performed at Florence on five successive nights. Indeed the scale was now decidedly turned against the predominance of the classic system; and another circumstance contributed at this time to prevent the return of that predominance for a very considerable period.

This was the invention, by Ottavio Rinuccini, of the *melodrama*, which more commonly took the name of *opera per musica*, and which we now briefly term the opera. The magic power of this union of music with the romantic drama completed the triumph of the latter among the Italians of the seventeenth century; for not only was this musical melodrama thenceforward their prime theatrical favourite, but the ordinary drama itself was no longer tolerated except under the romantic garb. To the despair of the few who still adhered to the classic school, the very names of *tragedy* and *comedy* were for a while laid aside; and the public would hear of nothing but those *azioni*, which went by the various names of *reali*, *reali-comiche*, *tragi-comiche*, *tragi-satiro-comiche*, &c., and seem to have been all translations or imitations of Spanish pieces.

At the same time the public continued their favour to a species of comedy, or rather comic recitation, which in Italy seems to have been in all times peculiarly national. This was called the *commedia a soggetto* or *commedia dell' arte*. It consisted of the mere outline of a dramatic composition, wherein the parts very slightly sketched were assigned to the several performers, who were to fill them up extemporaneously. These sketches were called *scenari*, from their containing merely the argument of each scene: those of the comedian Flaminio Scala were particularly celebrated. Some of these *improvvisatori*, especially those who appeared in the standing masks of Arlecchino, Pantalone, Pulcinella, &c., displayed a liveliness of humour which, in spite of the gross mass of empty buffoonery by which they were accompanied, made this kind of performance long continue to be much relished by the Italians, until the more general cultivation given to the higher dramatic departments, and the general advance of social refinement, caused the improvisatory masks to be finally abandoned to the populace.

At the commencement of the eighteenth century, no great original genius had yet arisen in Italy, as in Spain and England, to establish the romantic drama on an unshaken foundation. The political preponderance of Spain, too, had now given place to that of France; and hence it is not surprising that the French taste now began to invade the Italian theatre as it subdued the Spanish. Girolamo Gigli, of Sienna, an ingenious critic and an elegant writer, gave, in his 'Litiganti,' a free translation of the 'Plaideurs' of Racine; recast Molière's 'Tartuffe' in his 'Don Pilone,' and endeavoured to bring upon the stage 'La Sorella di Don Pilone,' wherein, it is believed, were exhibited the caprices of the author's wife and the bigotry of her Jesuit confessor. This period is also remarkable for the production of a number of comedies expressly devoted to the service of the literary warfare of the time, in the mutual satire by the literati of each other's peculiar systems and opinions. These pieces, as may well be supposed, were much more academical and erudite than theatrical and entertaining.

In the *reform* or *purification* of the Italian stage, as the endeavours now making to follow the *classic* steps of the French were denominated, Maffei led the way in the tragic department. The first classical tragedy that had appeared in modern Italy, or indeed in modern Europe, the 'Sophonisba' of Trissino, already mentioned, was a dull work of diligence without any poetic spirit; wherein, however, it is singular that while all the antique forms, including the chorus, are scrupulously retained, the author has abandoned the field of mythology for that of Roman history. The pastoral dramas of Tasso and Guarini, which appeared about the middle of the sixteenth century, and in which the subject, though for the most part not tragical, is elevated and even ideal, though more important in the history of poetry than of the stage, were certainly intended for the theatre. Their choruses indeed float like lyrical voices in the air, and do not appear in person; but the pieces were exhibited with great splendour at Ferrara and Turin. With all their noble and exquisite poetic grace and beauty, they at the same time show us the infant state of the *dramatic* art in the languid progress of the action. After 'Sophonisba' and a few other pieces of the same period, which Calsabigi, an Italian critic wholly devoted to the French system, calls the first tragic lispings of Italy, a number of similar works of the sixteenth and seventeenth centuries might be cited, but not one of them has preserved any considerable reputation. Though all these writers laboured, as they thought, according to the rules of Aristotle, we have the following description of their tragical abortions from Calsabigi himself:—'Distorted, complicated, improbable plots, misconception of scenic regulations, useless personages, double actions, inconsistency of character, gigantic or childish thoughts, feeble verses, affected phrases, total absence of harmonious and natural poetry; all this decked out with ill-timed descriptions and similes, or idle political and philosophical disquisitions; in every scene some silly amour, with all the trite insipidity of commonplace gallantry; but of tragic strength, of the conflict of passions, of overpowering dramatic catastrophes, not the smallest trace.' Maffei, however, to whom we must now return, printed a selection of the best of these tragic attempts, and produced a tragedy of his own, entitled 'Merope,' which had great success in Italy on its first publication, and obtained a high reputation in other countries from its competition with Voltaire's tragedy on the same subject. Both writers attempted to restore in some sense a lost piece of Euripides, highly estimated by the ancients from the account given of its contents by Hyginus. Maffei's work, however, is rather the production of a learned antiquary than of a mind naturally adapted for and practised in the dramatic art; it is not therefore unfair to attribute its great reputation in Italy to the previous low state of Italian tragedy.

The task of classicising the musical drama was undertaken first by Apostolo Zeno, and afterwards, with more success, by the Abate Metastasio. The marks of the French taste in Metastasio, as pointed out by Schlegel, are, the total absence of the romantic spirit, a certain faultless insipidity of composition, his manner of handling mythological and historical materials, which is not properly either historical or mythological, and the endeavour to produce a certain tragic purity which degenerates into monotony. The unity of place, however, it was impossible for him to observe, as a change of scene was required of the opera-poet: in his rich intrigues too he followed Spanish models.

and borrowed especially a great deal from Calderon. 'The merits,' says the German critic, 'which have gained him the reputation of a classic among the Italians of the present day, and have made him in some degree for them what Racine is for the French, are, the most perfect purity, clearness, elegance, and sweetness of language in general, and in particular the softest melody and the greatest loveliness in the songs. Perhaps no poet ever possessed in a greater degree the talent of comprehending in a few lines the essential features of a pathetic situation: the songs with which the characters make their exit are almost always the purest musical extract of their state of mind that can possibly be given.' On the other hand, he has lines which, for dignity and vigorous conciseness, are perfectly suited to tragedy; yet on the whole, it is evident that a certain melting effeminacy in feeling and expression rendered Metastasio the delight of his countrymen and of courtly society throughout Europe. Only a few of his operas have still possession of the stage, as the change of taste in music demands a different arrangement of the text. Metastasio seldom has choruses, and nearly all his airs are for a single voice. 'We now,' says Schlegel, 'require more frequent duos and trios, and a crashing finale. In fact, the most difficult problem for the opera poet is, the mixing the complicated voices of conflicting passions in one common harmony without injuring their essence; a problem, however, which is generally solved by both poet and musical composer in a very arbitrary manner.'

The first endeavour to restore what the classicists denominated the *true comedy* was made by Luigi Riccoboni, a theatrical manager, who attempted, on the Venetian stage, to revive the 'Scolastica' of Ariosto. The result was remarkably curious: the audience, idolizing in Ariosto the painter of the romantic loves of Orlando and Angelica, and eagerly expecting to see something of a kindred spirit in this long neglected dramatic production from such a pen, showed such indignation at the disappointment they received from this *regular* comedy, that Riccoboni hastily quitted Venice, and repaired to Paris, where, of all places in Europe, classicism was in greatest honour and glory. Venice, however, was destined shortly after to be the scene of a successful struggle on the part of the same comic school to re-establish itself in the public estimation. A native of that city, Carlo Goldoni, nursed, both as a comedian and a poet, in the study of Macchiavelli and Molière, and, it should seem, admirably qualified by nature for developing all the resources that can enter into that comparatively narrow dramatic circumscription, sedulously applied himself, in a series of original compositions, to the task in which Riccoboni had made so unlucky an experiment. He displayed such abundant nature and fertility in painting the manners and the follies of his own age and country, that at length he brought the comedy of *character* into vogue, to the discredit both of the improvisatory farce and the melodrame. His first successes, however, received a severe check. The injury sustained by the masked and improvisatory comedy, for which the company of Sacchi in Venice had the highest talents, was one of the causes that led to the production, at this period, of the fantastic dramas of Gozzi. These are fairy tales in a dramatic form, in which, however, along with the wonderful, versified, and serious part, this author introduced the whole of the masks, and allowed them the most unrestrained development. When his imagination was in some degree wearied with oriental tales, he applied himself to the re-modelling of Spanish plays, especially those of Calderon; and although the ethereal poetry of the Spaniard lost much of its delicacy under this kind of handling, yet the extravagant caricature of the Italian masks formed an admirable contrast to the wild wonders of the fairy tale. This bold and original flight in the romantic region so fascinated the Venetians, that Goldoni was fairly driven from the field, and retired to Paris, as Riccoboni had done before him. There, by his production of 'Le Bourru Bienfaisant,' &c., he had the satisfaction of exhibiting himself to the French as the ablest follower that had yet appeared in the track of Molière, and of being honoured and applauded accordingly

It is a remarkable instance, too, of the sway which French criticism at that day exercised over the European continent, that Goldoni's Parisian success mainly contributed to his speedy reinstatement in Italian favour, and to the proscription of the wildly romantic pieces of Gozzi. From the pen of Goldoni we have about a hundred and fifty pieces, of which no enumeration can here be attempted. Among the comic dramatists of his own country he still occupies the highest place; and though some very respectable writers in the same department have succeeded him, they have done little either to extend or to enrich the dramatic field. We shall therefore, in enumerating the principal of these, dismiss them with all possible brevity.

Francesco Albergati Capacelli, a Bolognese gentleman of a distinguished family, and on that account more familiar than Goldoni with the tone of good society, displays in his comedies a purer style, more dignified manners, and occasionally more elevation in his characters, but wants the nature and vivacity of his predecessor. Camillo Federici, a Piedmontese, who had originally entered the order of Jesuits, afterwards became a comedian and a prolific writer of comedies: taking his characters chiefly from history, romance, or allegory, he inclined much to the romantic school; but, though he was very popular in his time, and though his countrymen the Piedmontese strove to raise him as high in comedy as Alfieri in tragedy, yet he did not exhibit powers at all capable of permanently establishing the romantic drama in public favour. Gherardo de R of Rome, was a tamely correct follower of Goldoni; and Conte Giraud, also a Roman, full of natural wit and liveliness, is the most spirited successor of the latter that has yet appeared, and has succeeded accordingly. We find Vittorio Alfieri himself devoting, in his latter years, his austere pen to comedy. He translated some pieces of the antients; and in his original comedies he appears to have made Aristophanes his principal model, mixing up the historical and the actual with the fictitious and the allegorical. Four of these bearing the quaint but significant titles of 'The One' ('L'Uno'); 'The Few' ('I Pochi'); 'The Too Many' ('I Troppi'); and 'The Antidote' ('L'Antidoto), are thoroughly political, being designed to exhibit, under the veil of antique names and manners, the several effects of despotism, of oligarchy, of simple democracy, and of rational liberty. The small pieces of the Neapolitan Giulio Genoino, written for the exercise and instruction of youth, are worthy of mention as being among the best in that peculiar and rather difficult line of theatrical composition. These comedies, ten in number, first appeared many years ago, under the title of 'Dramatic Ethics' (Etica Drammatica), five of them being designed for boys and five for girls. In none of them is there the slightest trace of the passion of love, or any injudicious exhibition of high-flown heroism. The quiet sentiments and duties they are designed to inculcate are sufficiently indicated in their titles—'Religion;' 'Love of our Neighbour;' 'Gratitude;' 'Modesty;' 'Friendship;' 'Prudence;' 'Filial Piety;' 'Conscience;' 'Generosity;' 'Beneficence;' and the author has succeeded in giving to these juvenile plays a greater warmth of interest than might be expected from the very circumscribed nature of his plan. Alberto N born of a good family at Turin in 1775, and bred to the law, but early addicted as a recreation to dramatic writing, is the most celebrated and productive among the living comic writers of the school of Goldoni: with stricter moral views than the latter, his most characteristic excellence with respect to art is the great correctness and purity of his language and style, in which the best critics of his country have declared him to be unsurpassed.

In the latter period of the last century, Alfieri opened a new æra of Italian tragedy. He adhered indeed to the established classic school, took his subjects chiefly from antient story, and was a strict observer of the unities. Indignant at the voluptuous degeneracy of his countrymen, his muse too uniformly appears with a stoical severity and simplicity which, how well soever they might be suited to the purposes of the moral and political reformer, are unfavourable to the primary objects of dramatic art; and hence the productions of Alfieri have ever been found to give more satisfaction in the closet than on the stage. As a dramatist he has been the most successful in painting, as in his 'Virginia,' the public life of the Roman republic; and in his tragedy of 'Saul' we find, with a certain Oriental splendour, a lyrical sublimity of expression. Since Alfieri, that nobler and more masculine-spirited Italian tragedy, of which he is justly regarded as the founder, has been cultivated by several distinguished writers with a less rigid adherence to antient subjects and to classic forms. Among the most estimable of these recent productions we may particularize the 'Aristodemo,' the 'Cajo Gracco,' and the 'Galeotto Manfredi of Vincenzo Monti; 'Il Conte di Carmagnola' and 'L'Adelchi,' of Alessandro Manzoni, better known in England as an historical romance-writer; and the 'Antonio Foscarini,' the 'Giovanni da Procida,' the 'Lodovico il Moro,' and the 'Nabucco' of Giovan Battista Niccolini, who in this latter piece has ably exhibited, under fictitious names, Napoleon and some of his contemporaries, and of whose future efforts his countrymen have the highest expectations.

In the musical drama, though for a long time past the poetry has been cultivated as little more than a mere vocal accessory to the musical composition, there have been some very meritorious exceptions to this, as in the case of the recent productions, by the Conte Pepoli, 'I Puritani,' and 'Malek Adel,' which last is founded on Madame Cottin's well known romance of the time of the crusades, and was first performed at Paris in 1836.

SPANISH DRAMA.

In Spain, as elsewhere, it was the church that gave birth to the modern drama; but this remarkable circumstance is peculiar to Spain, that while in the other great nations of Europe the mature development of the drama detached it wholly from the service of religion, in the peninsula on the contrary the greatest dramatic geniuses constantly devoted a large portion of their efforts to religious compositions for ecclesiastical purposes; and the most perfect of all the Spanish theatrical poets made such compositions his favourite occupation. Owing to this very striking peculiarity of the Spanish stage, the causes of which also will be indicated below, we defer some further notice of the spiritual plays of the Spaniards until we come to particularize the several species of their dramatic productions as exhibited in the most advanced period of their theatre.

The earliest performance that can strictly be called theatrical of which we find any mention in the Spanish annals, is that exhibited in 1414 at the coronation festival of Ferdinand the Good, king of Arragon. It was from the pen of the marquis De Villena, a man who possessing intellectual acquirements prodigious for the time in which he lived, exercised boldly, as a writer, in advance of his age and nation—so boldly, indeed, that all his writings were burned after his death, and this piece among them, so that its very title has perished. We only learn that it was an allegorical piece, wherein figured the personages of Justice, Peace, Truth, and Clemency; so that it seems to have belonged to the class of *moralities* in vogue for a while in the infancy of the Spanish drama, and which Cervantes afterwards revived. Shortly after this attempt of Villena, his friend, the marquis de Santillana, a man of equally extensive knowledge, and of equal freedom both of thought and pen, dramatized, under the title of 'Comedieta de Ponza,' the incidents of a naval action which took place in 1435, near the island of Ponza, between the Genoese and the Arragonese, and in which the latter were defeated. This piece was never acted, nor was it printed among the author's works; its title, quoted in his letters, was all that was known of it until Sr. Martinez de la Rosa (lately prime minister of Spain) recently discovered it among the manuscripts in the Royal Library at Paris. This interesting relic of the earliest efforts of the dramatic genius of Spain exhibits remarkable skill in the handling of an historical occurrence, as well as great beauty of plot, dialogue, and versification.

It was near the close of the fifteenth century that a sort of theatre was first established in Castile. The earliest dramatic attempt in this division of the peninsula was made by Juan de la Encina, who excelled in light poetry, and whose numerous works form a cancionero of themselves. After extending the field of religious representations by composing for exhibition on festival days a number of autos, wherein we find, not mere paraphrases of Scripture, but conceptions of the poet's own, together with a certain dignity of action and language, he formed the project of carrying the stage beyond the walls of the church. With this view he composed some small pastoral pieces, which he denominated eclogues. These pieces, in which he himself enacted the principal parts, were first exhibited at the houses of the Admiral of Castile and the Duchess del Infantado. As their name indicates, they consisted of nothing more than a dialogue between two or more shepherds. The author, imitating Virgil, used this expedient in the first instance to celebrate, by means of allusion, some particular event, such as the conclusion of a peace, or the return of a prince; and next, he invented some short and simple action wherein he brought into play the passions of his interlocutors themselves. These little pieces, interrupted by dances, and ending with songs (villancicos), usually contained also some farcical scenes; so that they may be said to have comprised at once the elements of the comedy, the ballet, and the vaudeville. These premature efforts have in them much grace and wit, as well as nature and liveliness. The first performance of these pastoral comedies took place in the year 1492, so memorable in the Spanish annals as being that of the conquest of Granada and the discovery of the New World.

About the same time appeared the famous 'Celestina,' begun by Rodrigo Cota and finished by Fernando Rojas de Montalvan. Though entitled a 'tragi-comedy,' it was never performed, nor was it capable of being so, as it was in reality but a tale told in dialogue. Yet the singular merit of this truly primitive composition, which went through several editions, and was translated into almost every European language, contributed much to the advancement of the stage by furnishing a genuine model of dramatic diction.

It was in the beginning of the sixteenth century that to these various attempts succeeded the first regular Spanish dramas, but, through a singular concurrence of circumstances, they appeared out of Spain. One Bartolomé de Torres-Naharro, long a captive in the hands of the Moors, and residing at Rome after his redemption, there composed some comedies in his native language, and got them performed at the tasteful and voluptuous court of Leo X. at the same time that, as we have already seen, the 'Mandragola' of Machiavelli and the productions of Aretino were being exhibited there. In the compositions of Torres-Naharro, though little known, and unjustly depreciated by Signorelli in his 'Historia Critica dei Teatri,' there is much happiness of invention, well-drawn character, and spirited dialogue; they have also the licentious tone of the Italian comedies of that period, and contain some strokes of a malicious boldness peculiar to the author, who, though a priest, and living at the pontifical court, composed satires against the church such as Luther himself might have dictated. On printing his comedies at Naples in 1517, under the title of 'Propaladia,' he published along with them some 'Precepts on the Dramatic Art,' the first that made their appearance in the Castilian tongue. He there draws a very distinct line between tragedy and comedy; he divides the latter into historical comedy (comedias a noticia), and comedy of invention (comedias a fantasia). He too it was that invented the introito, or prologue, and gave to the acts the name which they have ever since borne, of jornadas, that is, journeys or stages, alluding to the pauses or resting-places for the actor and the spectator, which seem to constitute the chief utility of such divisions.

No sooner did Naharro's pieces find their way to Spain (about 1520) than they were proscribed by the Inquisition, so watchful to extirpate every trace of Protestantism. The like sentence fell upon those written shortly after in Germany by the author of the 'Satire on Women,' Cristoval de Castillejo, secretary to the emperors Maximilian and Ferdinand. These latter pieces, which it was not deemed prudent to publish among the author's works when the prohibition was taken off in 1573, but which are known to have been of the satirical and licentious class, are entirely lost. So that the Spanish stage presents the singular phenomenon of having really had two infancies. The first attempts in regular dramatic composition being suppressed by the formidable authority above-mentioned, found no imitators, and even seem to have been completely forgotten, for it was a play of Ariosto's that was exhibited at the marriage of an infanta in 1548. Some few classical scholars, indeed, as Villalobos, Fernan Perez de Oliva, and Simon de Abril, strove to bring forward the ancients as dramatic models, by translating Plautus, Terence, and Aristophanes; but their works were still less adapted to take possession of the national mind. So that while, of those dramatic productions which Spain already possessed, one part lay hidden in the libraries of a few of the learned, and the other buried in the archives of the Inquisition, the people were abandoned to the gross merriment of the jugglers and buffoons. Hence it is that Schlegel, Bouterwek, Sismondi, and almost every other foreign critic, apparently ignorant even of the names of the first dramatic writers of Spain, make no mention of them, but fix the middle of the sixteenth century as the period of the earliest origin of the Spanish drama.

The founder of the truly national and popular theatre of Spain was Lope de Rueda, of Seville, who quitted his trade of a goldbeater to join a company of strollers, of whom he shortly became the chief, or, according to the Spanish expression, the *autor*. This title, derived, not from the Latin *auctor*, but from *auto*, an act or performance, was at that time given to one who composed and recited pieces, and is still retained to signify the manager of a company of comedians. He was also called *maestro de hacer comedias*. Lope de Rueda united the two kinds of talent necessary to an *autor* of that period; had prodigious success; was unanimously declared to be both a great poet and a great performer; and so entirely forgotten were the dramatic attempts which had preceded him, that he had the credit of being the inventor of the division into *jornadas* or acts, and of the prologue, called at first *introïto*, and afterwards *loa*. For a number of years Lope perambulated from town to town; but his great reputation at length made him in request at court; and the grandees of the time crowded to the diversion which his exhibitions afforded them from the gloomy gravity of the palace of Philip II. The few of his plays, pastoral dialogues, &c., that remain, are distinguished for natural grace and liveliness; and though these are all in prose, he wrote with equal facility in verse. We find a curious fact, illustrative of the indulgence which the Spanish ecclesiastics of that day extended even to the profane drama, recorded by Diego de Colmenares, the contemporary historian of Segovia,—that on occasion of the grand festival held on the opening of the new cathedral there in 1558, Lope's company, on a stage erected within the church, exhibited, after 'solemn vespers,' a 'pleasant play' (*una gustosa comedia*). And Lope himself, on his death at Cordova in 1567, was interred there with great honour in the choir of the great cathedral church.

'In the time of this celebrated Spanish actor,' says Cervantes in the Preface to his own published plays, 'the whole wardrobe of an *autor* could be thrust into a bag: there were three or four close vests of white skin trimmed with gilt leather, and the like number of beards, wigs, and trunk hose. The plays were colloquies in the manner of eclogues, between two or three shepherds and some shepherdess, and were eked out with two or three interludes (*entremeses*), exhibiting sometimes the character of a negress, sometimes of a bravo, sometimes of a simpleton, sometimes of a Biscayan; for these characters and many others Lope represented with the greatest truth and perfection imaginable. At that time there were neither machinery, nor decorations, nor combats between Moor and Christian, on foot or on horseback: there were no figures made to issue through the boards of the stage as from the centre of the earth; still less were any angels or souls let down from heaven upon clouds. The stage consisted of four planks, laid in a square form across four benches, which raised them four hands from the ground. The whole decoration consisted of an old coverlet, which was drawn from one end to the other by two cords, to make what was called the *vestiario*, or dressing-room, and behind which were the musicians, who sang, without the guitar, some antient *romance*.'

At the same period (1561), the Spanish court, which had hitherto migrated from one provincial capital to another, fixed itself permanently at Madrid, a circumstance favourable to the dramatic art, as it established a permanent theatre. Authentic documents attest, that a year after the death of Lope de Rueda, there were play-houses (*corrales de comedias*) at Madrid. There were then, in the capital as well as in the provinces, various troops of actors, distinguished one from another by whimsical and ludicrous names, and sufficiently numerous to be classified by a Spanish writer of that day under eight different species. Shortly after, Juan de Malara, a celebrated professor of the *humanities*, caused a versified drama of his, entitled 'Locusta,' which he had written at first in Latin, to be acted at Salamanca. Then came an actor of Toledo, named Navarro, who, Cervantes tells us, converted the manager's clothes'-bag into the more important-looking form of trunks and portmanteaus; brought forth the music from behind the hanging; took the false beards from the chins of those whose parts did not require them; invented machinery, clouds, thunder and lightning, duels and battles. Moral development, too, accompanied this material progress: the pieces now began to display something like a plot, and some of the animation which arises from conflicting interests and passions. The titles of a few of these may afford some notion of this transitional, or, more properly, adolescent period of the Spanish theatre: there were, for instance, 'Dido and Æneas, or the Pious Trojan,' 'The Grand Prior of Castile,' 'Loyalty against one's King,' 'The Sun at Midnight and the Stars at Noon,' 'The Taking of Seville by St. Ferdinand,' and 'The Cortes of Death;' the costume of which latter piece is so humorously described in a passage of the second part of Don Quixote.

About 1580 were established at Madrid the two theatres *de la Cruz* and *del Principe*, which are still existing: and now some superior minds turned their efforts to dramatic composition, which had hitherto been left entirely to the managers of strolling companies. Cervantes, just returned from his eventful Algerine captivity, was one of the earliest adventurers in this career. 'I was the first,' he tells us, 'that exhibited the imaginings and hidden thoughts of the soul, by bringing forward moral characters on the stage, which I did with warm and general applause from the public. I wrote at that period some twenty or thirty plays, which were all acted unsaluted by cucumbers or any other matters convenient for pelting with; they ran their course free from hissing, shouting, or clamour.' Cervantes, indeed, advanced the Spanish drama most importantly, both as to dramatic invention and moral dignity. His 'Numancia,' in particular, one of the one or two of these his earlier dramatic productions that have found their way to the press, is very remarkable in the dramatic history of Europe. 'It stands altogether,' observes Schlegel, 'on the elevation of the tragical cothurnus; and, from the unconscious and unsought-for approximation to antique grandeur and purity, forms a remarkable phenomenon in the history of modern poetry. The idea of destiny prevails in it throughout; the allegorical figures which enter between the acts supply, though in another way, nearly the place of the chorus in the Greek tragedies; they guide our consideration and propitiate our feeling. A great deed of heroic determination is completed; the extremity of suffering is endured with constancy, but it is the deed and suffering of a whole nation, whose individual members may almost be said to appear only as examples, while the Roman heroes seem merely the instruments of fate. There is a sort of Spartan pathos in this piece; every separate consideration is swallowed up in the feeling for country; and by a reference to the modern warlike fame of his nation, the poet has contrived to connect the antient history with the circumstances immediately before him.' On the whole, however, it appears that the mind of Cervantes was more inclined to the *epic*, taking the word in its more extensive signification for the narrative form of composition in general; and that the soft and unassuming manner in which it chiefly delights to excite the feelings is not the best suited to the rapid compression required on the stage.

Cervantes wrote at Madrid; and at the same time Juan de la Cueva produced some dramas on the stage of Seville, reducing to four the number of jornadas, or acts, which had hitherto been five or six. The day's performance then consisted, besides the principal piece, of three *entremeses*, or interludes, played between the acts, and a little ballet. Valencia, too, which had always, in arts and letters, its rival school to that of Seville, made some advances in the dramatic career. It was a Valencian poet, Cristobal de Virues, who further reduced the number of acts from four to three, which latter number was thenceforward adhered to by all Spanish writers. 'Until then,' according to the ludicrous conceit of Lope de Vega, 'the Spanish drama had gone on *all fours*, like a child, because it was yet in its infancy.'

The scenic pomp of the Spanish theatre had already made great progress. The same writer, Rojas, who said that in the days of Lope de Rueda an *autor* and his company might have deposited their bundle of *properties* upon a spider's back, relates, that in the time of Cueva and Virues, women played their parts in dresses of silk and velvet, with chains of gold and pearls; that, in the interludes, airs were executed by three or four voices; and that even horses were introduced in the warlike plays to complete the illusion.

It is well worthy of remark that already, in the sixteenth century we find, in Spain the contest fully and warmly engaged between the claims of the dramatic writers to an absolute independence of the classic rules, and the critics demanding a rigid adherence to the precepts of Aristotle. Thus, while the rhetorician Pinciano was zealously conjuring the [illegible] tional writers to respect the unities, for which they showed little regard, one of them, Juan de la Cueva, openly undertook, in his 'Exemplar Poetico,' the defence of the dramatic liberties. He claimed them as the offspring of that enlightenment of ages which had abolished all antique laws,—as more favourable to the bolder flights of imagination,—and, in fine, as better adapted to please the public. But, while delivering this judicious opinion, he lays down such maxims for the regulation of this dramatic freedom as good sense and good taste must ever dictate, though his countrymen, in their fiery impatience of any such restriction, have not paid them sufficient attention.

This uncontrollable fervour of imagination was however but a necessary result of the very peculiar circumstances which for a long course of ages had operated to form and to confirm the Spanish national character. 'The Spaniards,' to use the words of Schlegel, 'act a glorious part in the history of the middle ages, a part too much forgotten by the envious ingratitude of modern times. They were then the forlorn outpost of Europe; they lay on their Pyrenean peninsula as in a camp, exposed to the incessant irruptions of the Arabians, and always ready for renewed conflicts without foreign aid. The re-establishment of their Christian kingdoms, for centuries from the time when the descendants of the Goths who had been driven back into the northern mountains rushed forth again from those places of refuge, down to the complete expulsion of the Moors from Spain, was one single and long-continued adventure; nay, the preservation of Christianity in that land against such a preponderating power seemed even to be the wondrous work of more than mortal guidance. Ever accustomed to fight at one and the same time for his liberty and his religion, the Spaniard clung to the latter with a fiery zeal, as to an acquisition dearly purchased by the noblest blood. Every foundation of divine worship was a reward of heroic exertion; every church might be considered by him as a trophy of his ancestors.' In later times, 'the Spaniard never presumed to examine into the conduct of his spiritual and worldly superiors, but carried on their wars of aggression and ambition with the same fidelity and bravery which he had formerly displayed in his own wars of defence. Personal fame and a supposed zeal for religion blinded him as to the justice of his cause. Unexampled enterprises were successfully executed; a newly discovered world beyond the ocean had been subjugated by a handful of bold adventurers; individual instances of cruelty and rapine had stained the splendour of the most determined heroism, but the mass of the nation remained unaffected by this degeneracy. The spirit of chivalry nowhere survived its political existence so long as in Spain: long after the internal prosperity of the nation, together with its foreign influence, had experienced a deep decline in consequence of the ruinous errors of Philip II., that spirit propagated itself down to the flourishing period of their literature, and imprinted its stamp upon it in a manner which cannot be mistaken. The fancy of the Spaniards was bold, like their active powers; no mental adventure seemed too dangerous for it. The predilection of the people for the extravagantly wonderful had already been shown in the chivalry romances. They wished to see the wonderful once more on the stage; and when their poets, standing on a high eminence of cultivation in art and social life, gave it the requisite form, breathed into it a musical soul, and purified it from corporeal grossness to colour and fragrance, there arises from the contrast between the subject and the form an irresistible fascination. Their spectators imagined they perceived a refulgence of the world-conquering greatness of their nation then half lost, when all the harmony of the most varied metre, all the elegance of fanciful allusion, all that splendour of imagery and comparison which their language alone could afford, were poured out into inventions always new, and almost always pre-eminently ingenious. The treasures of the most distant zones were procured in fancy, as in reality, for the gratification of the mother country; and we may say that in the dominions of this poetry, as in those of Charles V., 'the sun never set.'

Such was the public mind upon which Lope de Vega now came to exercise his marvellous fertility of dramatic invention and facility of metrical composition. He had one first great requisite for success in this career, a most thorough knowledge of the tastes and passions of the people for whom he wrote; but that further and nobler merit, an elevated view of his art and deep devotion to it for its own sake, he never evinced. Success, in the more vulgar acceptation of the term, was not only his first object, as with every popular dramatist it ought to be—it seems to have been his only one—and that success he attained even in an unparalleled degree, affording, perhaps, the most conspicuous instance upon record of the sacrifice of high and permanent literary reputation for unbounded living popularity. We do not, indeed, as so many writers have done, make it any subject of reproach to him that, as he himself tells us in his 'New Art of Play-writing' ('Arte Nuevo de hacer Comedias'), whenever he was going to write a play he used to shut the door upon Terence and Plautus, that they might not cry to heaven against him; but in the interests of art it is impossible to admit the excuse which in the same treatise he broadly offers for his extravagancies, namely, 'I write pieces for the public; and as the public pay, it is but right that, to please them, I should talk to them the language of fools.' After reading such an admission as this from his own pen, we need not wonder at finding in the large portion that remains to us of his countless dramatic productions, that his exhaustless invention of incident, his varied skill in delineating characters and exhibiting the play of the passions, with all the spirit and subtlety of his dialogue—that all those brilliant qualities have, as it were, nearly stifled one another by their own unpruned luxuriance.

Neither in his own country, however, nor in Europe, had Lope any model to guide him or rival to excite his emulation. Italy had not yet got farther than the *Mandragola*, nor France beyond her first uncouth imitations of the ancients; Germany had not yet emerged from the *mysteries*; and England, except politically, was a terra incognita to the Spanish writers.

In 1621, twelve years before the death of Lope de Vega, happened that of the gloomily devout Philip III., who was succeeded by a young prince addicted to pleasure and passionately fond of the theatre. Philip IV. liked the conversation of literary men, received them at his court, and amused himself with enacting along with them that sort of improvisatory pieces which were then so much in vogue in Italy. He is even the reputed author of some dramatic works which were brought out under an anonymous designation; and such was his prepossession in favour of the national drama that he would not allow the introduction of the Italian opera, then in general favour at the continental courts. These circumstances added force to the impulse already given by Lope de Vega, and introduced the most brilliant period of the Spanish drama. During Lope's lifetime, a multitude of writers endeavoured to tread in his steps—as the Drs. Ramon and Mira de Mescua, the licentiates Mexia and Miguel Sanchez, the canon Tarraga, Don Guillen de Castro, Aguilar, Luis Velez de Guevara, Antonio de Galarza, Gaspar de Avila, Damian Salustrio del Poyo, and a great many others,—but all were merely his imitators, and fell far below him; it was not until near the close of his dramatic reign that the rival appeared who was destined to dethrone him.

This was Calderon de la Barca, who, with no less intimate a knowledge of his public than Lope himself, had all that high devotion to his art which was wanting to the latter. As the compositions of this great writer occupy the summit of the truly national drama of Spain—as they fully equal those of Lope in variety and more nearly approach them in number than those of any other of his countrymen—and as, consequently, they afford us the most perfect specimens of each of the several species of dramatic productions which are peculiarly Spanish—there is no way in which we can convey so clear an idea of the forms and spirit of the Spanish stage in its highest maturity as by characterizing briefly but distinctly the several classes of Calderon's dramatic pieces. The principal classification of their plays on profane subjects recognized by the Spaniards themselves was that which distinguished *comedias heroicas*, *comedias de capa y espada*, and *comedias de figuron*. The first of these classes, the *heroic* plays, occupied much the same place in dramatic literature as the tales of chivalry did in narrative fiction: driven from prose composition by the Don Quixote, they seem to have taken refuge on the stage, where they were long welcomed by the public. The second class, named, from the costume of the time in which they were acted, plays of *the cloak and sword*, exhibited the Spanish manners of the day; but owing to the strong tincture of romance which those manners still retained, they were capable of being represented under an ideal aspect. 'This,' Schlegel remarks, 'could not have been possible had Calderon introduced us into the interior of domestic life, where want and habit generally reduce all things to every day narrowness. These pieces end, like the comedies of the antients, with marriages; but how different what precedes! . . . Calderon represents to us his principal characters of both sexes in the first ebullitions of youth, it is true; but the aim after which they strive, and in the prosecution of which everything else kicks the beam, is never confounded in their minds with any other good. Honour, love, and jealousy are uniformly the motives; the plot arises out of their daring but noble collision, and is not purposely instigated by knavish deception. . . . The feeling for honour is equally powerful in the female characters; it rules over love, which is allowed a place beside it, but not above it. The honour of the women, according to the manner of thinking exhibited in the dramas of Calderon, consists in loving only one man of unspotted honour, and loving him with perfect purity. Love requires inviolable secresy till a lawful union permits it to be publicly declared. This secresy secures it from the poisonous intermixture of vanity, which would boast of pretensions or conceded favours; it gives it the appearance of a vow, which, from its mystery, is the more sacredly observed. In this morality, it is true, cunning and dissimulation are allowed for the sake of love, and so far honour may be said to be infringed on; but the most delicate regards are nevertheless observed in the collision with other duties—as, for example, with those of friendship. The power of jealousy, always alive, and often breaking out in a dreadful manner—not, like that of eastern countries, a jealousy of possession, but of the slightest emotions of the heart and its least perceptible demonstrations, serves to ennoble love, as this feeling, whenever it is not altogether exclusive, sinks beneath itself. The perplexity to which the collision of all these mental motives gives rise frequently ends in nothing, and then the catastrophe is truly comic: sometimes, however, it takes a tragic turn; and then honour becomes a hostile destiny for him who cannot satisfy it without either annihilating his own happiness, or even becoming a criminal.' These pieces have commonly no other burlesque part than that of a merry servant, called by the Spanish writers the *gracioso*, who chiefly serves to parody the ideal motives from which his master acts, which he is often made to do in the most elegant and witty manner. He is seldom used as an efficient instrument in complicating the intrigue, in which we seem to admire the ingenuity of accident rather than of contrivance. The *comedias de figuron*, or plays of *character*, are distinguished from the class last described, chiefly by this—that the interest of the action, instead of being distributed over the personages of a double or triple intrigue, is centred in some one individual, in whom some particular vice or absurdity is broadly personified.

Some of Calderon's plays, historical or mythological, cannot strictly be ranked in any of the three foregoing species. The earlier periods of Spanish history he has often seized with the utmost truth; but he seems to have had too vehement a predilection for his own clime and nation to enter easily into the peculiarities of another. Classical antiquity, as well as the north of Europe, were altogether foreign to his conception; and thus, as Schlegel observes, the Greek mythology usually became in his hands a delightful tale, and the Roman history a majestic hyperbole. 'Another class of his pieces are entitled by Calderon himself *festal* dramas (*fiestas*). These were designed for representation at court on solemn occasions: although they require the theatrical pomp of frequent change of decoration and visible wonders, and though music is often introduced into them, yet we may call them *poetical* operas, that is, dramas which, by the mere splendour of poetry, achieve what in the actual opera can be attained only by the machinery, the music, and the dancing. Here the poet gives himself wholly up to the boldest flights of his fancy, and his creations hardly touch the earth.'

But it is in the class of *autos sacramentales*, or religious dramas, of which we must now speak, that the genius and spirit of Calderon are most richly and fully developed. As the religious ceremonies of Paganism had given birth to the Grecian theatre, so did those of Christianity give birth to the modern. The original principle of the dramatic spectacles, introduced or sanctioned by the Romish ecclesiastics, was that of exhibiting before the eyes of the faithful, on each of the great festivals of the church and commemoration days of the saints, a living representation of the passage of the New Testament or of legendary history to which the celebration in question referred. These performances, which, in all the rest of Europe went by the name of mysteries, were, in Spain, called from the beginning *divine plays* (*comedias divinas*) and *sacramental acts* (*autos sacramentales*). They were performed with great pomp, not only in the public squares and in processions, but also at the great theatres of the capital. This species of dramas, being performed on the most solemn festivals, under the patronage both of the ecclesiastical and the civil authorities, and in the presence of the whole people, were more profitable as well as more glorious to their authors than any other kind. Lope de Vega wrote some hundreds of these pieces; but Calderon, in this department as in others, so far excelled both his predecessors and his contemporaries, that letters patent were granted to him conferring the exclusive privilege of furnishing the *autos* for the use of the capital; a monopoly which he enjoyed for thirty-seven years. 'His mind,' to borrow the eloquent characterization of his able German translator, 'is most distinctly expressed in his treatment of religious subjects. He paints love with general features merely, he speaks its technical poetical language. But religion is his peculiar love, the heart of his heart. For religion alone he excites the most overpowering emotions, which penetrate into the innocent recesses of the soul. It would rather appear that he did not wish to enter with the same fervour into worldly events. However turbid they may be in themselves, yet, from the religious medium through which he views them, they appear to him perfectly bright. This fortunate man escaped from the wild labyrinth of doubt into the citadel of belief, from whence he viewed and portrayed the storms of the world with undisturbed tranquillity of soul: human life was to him no longer a dark riddle. Even his tears reflect the image of heaven, like dew-drops on a flower in the sun. His poetry, whatever its object may apparently be, is an incessant hymn of joy on the majesty of the creation: he celebrates the productions of nature and human art with an astonishment always joyful and always new, as if he saw them for the first time in an unworn festal splendour. It is the first awaking of Adam, combined with an eloquence and skill of expression, and a thorough acquaintance with the most mysterious relations of nature, such as high mental cultivation and mature contemplation can alone give. When he compares objects the most remote, the greatest and the smallest, stars and flowers, the sense of all his metaphors is the mutual attraction of created things to one another on account of their common origin; and, again, this delightful harmony and unity of the world is with him but a refulgence of the eternal love which embraces the universe.'

We have felt it the more necessary to endeavour to convey some just idea of the real spirit and execution of these dramas, because in recent times, in England especially, they have, through ignorance of the works themselves, and of the national spirit and circumstances out of which they arose, been confounded, under the designation of productions evincing much more zeal than taste, with the rude and barbarous compositions which the remains of the dramatic mysteries of the other European nations almost exclusively present to us. On the contrary, the more perfect spiritual plays of the old Spanish theatre will remain, through all changes of manners and opinions, highly valuable and interesting, as showing us how some of the noblest efforts of modern dramatic art were devoted in one country, as those of all the other arts have so generally been, to the service of the Christian faith.

It is remarkable, that during this most brilliant period of the Spanish stage, the council of Castile ventured to propose, as a condition of the re-opening of the theatres, which, on account of court mournings, had remained shut from 1644 to 1649, that the plays to be performed should be confined to subjects of good example taken from edifying lives and deaths, without any mixture of love; that consequently nearly all those which had theretofore been acted should be prohibited, especially the works of Lope de Vega, which had been so prejudicial to good morals. But fortunately the taste of the monarch, in accordance with that of the public, made him reject the proposal of his austere advisers.

In the course of Calderon's protracted career arose Moreto, who, with less of the national fire of invention and richness of Toledo, distinguished himself chiefly by giving a more perfect development to the 'comedias de figuron,' or plays of character. Such, for instance, are his pieces 'El Lindo Don Diego,' which might be called 'The Coxcomb,' and 'El Marques de Cigarral,' a Don Quixote of a certain sort, grown mad over the eternal perusal of his family papers and reckoning up of his quarters of nobility. In this line Moreto may be regarded as one of the models of Molière, amongst whose pieces, indeed, there is one weak imitation of him. At the same period lived another dramatic poet whose living fame was not equal to his posthumous celebrity, yet who, by some extraordinary chance, has remained so unknown in other nations that the most eminent writers—Bouterwek, Schlegel, Sismondi—have not so much as mentioned him: this was a monk of the order of Mercy, Fray Gabriel Tellez, who, under the assumed name of Tirso de Molina, gave to the stage a great number of pieces, which were afterwards collected and published by his nephew. Less ingenious than Calderon, and less delicate than Moreto, he dares, however, excel every poet of his country in a certain mischievous gaiety. He pays little regard either to rule or probability, caring only to find room for the sallies of a laughing and caustic wit, a freedom of language which he carries even to licentiousness, and a boldness of thought which respects neither the powers of earth nor those of heaven. He spares nothing, but attacks whatever either offends or diverts him. There is but one writer to whom he can justly be compared, and to whom he bears a very striking resemblance; namely, the more recent French dramatist Beaumarchais. And as the latter writer was the original parent of Figaro, so it is a curious fact that Fray Gabriel was the first who brought upon the stage the famous story of 'Don Juan and the Statue;' availing himself of the legend invented by the Franciscan monks of Seville to account for the disappearance of the real 'Don Juan de Tenorio,' whom, in order to put a quiet end to his enormous excesses and impieties, the holy brethren had drawn into an ambush and slain.

The brilliant period of the Spanish theatre is comprised in the first half of the seventeenth century. The taste of the monarch, the court, and the nation, had thrown a multitude of literary men into that career, then the most honoured and the most lucrative. Thus, besides the eminent masters already mentioned, there were a host of dramatists of the second order, at the head of whom must be ranked Francisco de Rojas, who had all the qualifications of Moreto, but exceeded him in his defects. Then follow Guillen de Castro, Ruiz de Alarcon, La Hoz, Diamante, Mendoza, Belmonte, the brothers Figueroa (who wrote conjointly, like the French vaudevillists of the present day), Cancer, Enciso, Salazar, and Bances Candamo, each of whom, though establishing no school, produced at least some important composition.

The disasters that befel the Spanish monarchy in the latter years of the reign of Philip IV., together with a succession of court mournings which closed the theatres for a considerable time, gave the first blow to the dramatic art in Spain. In 1665, the death of that prince, who had been its most zealous protector, gave the signal for its rapid and thorough decline. His successor, the imbecile Charles II., was yet in his infancy; and the queen-regent signalised the commencement of her administration by a decree, dictated no doubt by her spiritual director the jesuit Nitard, and certainly unique in dramatic history: she commanded 'that all plays do cease until the king my son shall be old enough to be entertained by them.' Although this strange order could not be rigorously executed, yet it is plain how great an effect it must have produced at a time when literature could only thrive under the patronage of the great, and when the theatre could maintain itself against the reiterated attacks of the council of Castile only by the special protection of the monarch. But of the effect in question we find the most striking evidence in contrasting two remarkable facts. A memorial addressed to Philip IV. in 1632 by the comedian Cristoval Santiago Ortiz shows us that there were then in Spain upwards of forty companies of comedians (although the council would license no more than six); that these companies comprised about a thousand individuals; and that so many playhouses had been erected that there were very few cities, or even considerable towns, that had not at least one actually engaged. And yet, in 1679, at the marriage of Charles II. with a niece of Louis XIV., wherein all possible magnificence was displayed, no more than three companies could be got together to perform at court.

At this period of decay and neglect one writer alone endeavoured to support the faltering stage. Solis, the elegant historian of the conquest of Mexico, likewise devoted to the service of the theatre his brilliant imagination, polished wit, and glowing style. He has left us several plays well worthy of the dramatic period which he survived, one of which especially, entitled 'Love à la Mode' (El Amor al Uso), has peculiar excellence.

With Solis may be said to have expired the Spanish theatre properly so called. The elevation of Philip V. to the throne of Spain having given prevalence to the French taste, and introduced, at court at least, the habits and manners of the court of Louis XIV., the Spaniards, after having been, as we shall shortly show, the dramatic precursors and teachers of the French, were content to become their humble translators and copyists. In the course of the eighteenth century, it is true, some attempts to re-erect a national drama were made successively by Zamora, Luzan, Canizares, and Jovellanos; but these honourable endeavours had but a transitory success; and to arrive at a work of originality—after, however, noticing as such the *sainetes* (small satirical pieces) of Ramon de la Cruz—we must come down to the commencement of the present century, to Moratin, the witty and elegant author of 'The Coffee-house,' 'The Baron,' 'The Maiden's Yes,' &c., and next, to Martinez de la Rosa, who wrote 'The Mother at the Ball and the Daughter at Home.'

The description which we have already given of the several kinds of dramatic composition in the days of Calderon may sufficiently show that in the old Spanish drama the classic tragedy, even less than the classic comedy, could find a broad and effective place. Yet, misled, it should seem, in a great degree by the word *comedia*, which in Spanish has always had as comprehensive a signification as the English term *play*, many of the most eminent continental critics, especially among the French, have alleged a total absence of tragedy in the Spanish theatre, and spoken of it as a singular and unaccountable phenomenon. So obstinately have such critics been prepossessed by the *classical* distinctions in which they have been trained up, that they can gravely make this astounding assertion, even while admitting that 'the tragic element predominates in a great number of the most celebrated pieces of the Spanish stage, and that the most popular subjects appear in general, to use the antique phrase, more appropriate to the buskin of Melpomene than to the sock of Thalia.' This very predominance of either element, as we have shown in the opening of this article, is the only ground for distinction between tragedy and comedy that exists in the essence of human nature and of dramatic art, or even that admits of any precise definition. According to this more rational mode of classification, the old Spanish theatre, by the very admission of the critics in question, is abundantly rich in tragedy. We must notice very briefly the few scattered specimens of dramatic writing under the *name* of tragedy that appear in the early Spanish literature.

Boscan, who first introduced into Spain the Italian style of versification, is said to have made a translation from one of the tragedies of Euripides, which has not been preserved; and in like manner, almost immediately after, about the year 1520, the learned Fernan Perez de Oliva, returning from the court of Leo X., where he had witnessed the performance of Trissino's 'Sophonisba,' wrote two other imitations of the Greek theatre, the 'Venganza de Agamemnon,' taken from the 'Electra' of Sophocles, and the 'Hecuba,' translated from Euripides. These tragedies, written in elegant prose, remained unknown beyond the universities; nor have we reason to suppose that they were acted even there. About 1570, however, Juan de Malara gave to the theatre of Seville several tragedies on scriptural subjects, as 'Absalom,' 'Saul,' &c.; and at Madrid, then recently chosen to be the capital of the kingdom, a monk named Geronimo Bermudez produced, under the name of Antonio de Silva, two tragedies which deserve particular mention. They are founded on the remarkable history of Inez de Castro. The first of the two, entitled 'Nise Lastimosa,' and relating to the death of Inez, is imitated from a Portuguese play on the same subject by Antonio Ferreira; the second, entitled 'Nise Laureada,' exhibiting the revenge which the infante, become king, took upon the murderers of his wife, and the coronation of the corpse of Inez is more original than the first, but inferior to it in plot and development. These two pieces, divided each into five acts, with intervening choral odes, may be regarded as the first *regular* tragedies that were written in Castilian *verse*. About the same time also, at Valencia, where the first theatre, built in 1526, was the property of an hospital, were played various dramas, still more remarkable, composed by Cristoval de Virues, whom we have already had occasion to mention, and by Andres Rey de Artieda. Virues, a military officer, was one of the leaders in that day of the great Spanish school which had gloried from the first in spurning the Aristotelian restrictions. His first production was 'La Gran Semiramis,' a subject handled at the same time in Italy by Muzio Manfredi. Virues however, instead of the five acts of the Greeks, divided his play into three *jornadas*, which, together, contain the whole life of Semiramis, the first act being laid at Bactria, the second at Nineveh, and the third at Babylon. He afterwards produced successively, and with the same disregard to the unities, the tragedies of 'Cruel Cassandra,' 'Atila Furioso,' 'Infeliz Marcela,' &c. That entitled 'Elisa Dido,' which he himself announced as written 'conforme al arte antiguo,' is in fact the only one wherein 'the rules' are at all respected. So little however does its plot resemble the famous episode of the Æneid, which Ludovico Dolce had lately brought upon the tragic stage of Italy, that he makes his heroine remain faithful to her first husband Sichæus, and kill herself that she may not marry Iarbas. The associate of Virues in this old war against the classic rules, Juan de la Cueva, after imitating the 'Ajax' of Sophocles, brought out at Seville two original tragedies; one, 'Las Siete Infantes de Lara,' founded on a popular tradition; the other taken from Roman history, and combining two tragic subjects, the death of Virginia and that of Appius Claudius. Cueva was the first who dramatised this subject, which, since then, has been so repeatedly brought upon the stage. Meanwhile, at the Madrid theatre, the tragedies of the friar Bermudez were succeeded by those of Lupercio de Argensola, to which Cervantes, ever more prompt to applaud his contemporaries than to criticise them, gives much higher praise than they can now be admitted to deserve. Of the noble pathos of his own 'Numancia' we have already spoken.

It is plain how much the romantic spirit predominates over the classical, even in these productions *professedly* tragic of the old Spanish stage. When, however, the accession of Philip V. had brought the Spanish theatre within the influence of Parisian taste, not only were the French tragic poets translated into the language of Spain, but some attempts were also made by the Spanish poets to imitate them. Of this number were the 'Virginia' and the 'Ataulfo' of Montiano.

Subsequently, under the enlightened ministry of the marquis of Aranda, this endeavour was resumed by Fernandez de Moratin, Cadalso, and Garcia de la Huerta; the first of whom produced 'Hormesinda,' the second 'Don Sancho Garcia,' and the third 'Raquel;' but these works, though valuable, especially the last, were not striking enough to naturalize a species of drama so novel in Spain. At the commencement of the present century, the like effort was made with better success by Don Nicasio Alvarez de Cienfuegos, ably supported by the talent of the celebrated actor Isidoro Mayquez, in some sort a pupil of Talma, not unworthy of his master, besides that he approached nearer to the wonderful versatility of Garrick, for he succeeded not only in the tragic department, but in every other, even down to simple buffoonery. After Cienfuegos, who left an 'Idomeneo,' a 'Pitaco,' and a 'Zoraida,' appeared two other tragic poets who are yet living. One of these, Quintana, is the author of a tragedy entitled 'Pelayo,' and founded on the history of that old champion of the forlorn cause of Spanish independence against the triumphant Arabians, a truly noble and pathetic piece, of which the Spaniards of the present day, forced like their ancestors to repel a foreign domination, used to repeat the most energetic passages in marching to battle. The other is Martinez de la Rosa, lately prime minister, whose first production of this class was likewise a patriotic piece, 'The Widow of Padilla,' founded on the memorable struggle of the municipal cities of Spain against the tyrannical aggressions of Charles V. This tragedy, composed during the siege of Cadiz by the French, was performed there on a stage erected for that express purpose. Its author has subsequently produced a 'Morayma,' somewhat after the manner of the 'Mérope' of Voltaire, and an 'Œdipus,' played recently at Madrid, wherein, says one of the most intelligent critics of Spanish literature (M. Louis Viardot), he has contrived to be original on a subject already treated by Sophocles, Seneca, Corneille, Voltaire, La Motte, and Dryden.

As regards the present theatrical vogue of the elder Spanish dramatists in their own country, we may remark that while Lope de Vega is almost wholly banished to the libraries, and while Calderon and Moreto seldom occupy the stage, Tirso de Molina, whom we have already characterized, is to be seen there more frequently than any other of the old dramatic writers. The late king, Ferdinand VII., so renowned for his delicate testimonies of devotion to the Virgin, used to enjoy most royally the *rich* jokes of the free-witted friar; and this declared predilection imposed silence on the susceptibility of certain agents of authority which the friar's bold attacks upon the great were calculated to arouse. His comedy, entitled 'Don Gil of the Green Breeches' (Don Gil el de las Calzas Verdes), was Ferdinand's especial favourite; and accordingly the municipality of Madrid never failed to have this dainty served up to him on state occasions.

Although the performance of the *autos sacramentales* on the ordinary stage was suppressed in 1765, in the reign of Charles III., yet the seasons of Advent and Lent, and more especially the Holy Week, are still solemnized by theatrical representations in the great churches: a sort of stage, called *the monument*, is erected in the choir, upon which are played the acts of the Passion, wherein the numerous characters that successively figure in the piece still wear the costume of the middle ages as it must have been at the origin of these exhibitions,—san-benitos, black masks, high pointed caps, long skirts, belts, or rather breastplates, made of cords,—all the wardrobe, in short, of an *auto-da-fé* procession.

FRENCH DRAMA.

In France the *mysteries* appear to have had their immediate source in the pilgrimages so common in those days. Menestrier tells us (*Représentations en Musique Anciennes et Modernes*) that the pilgrims to the Holy Land, St. James of Galicia, Mont St. Michel in Normandy, and the various other places of pious resort in France and abroad, used to compose rude songs on their travels, wherein they introduced a recital of the life and death of Christ, or of the last judgment: in others they celebrated the miracles of saints, their martyrdom, and divers wonderful visions and apparitions. These pilgrims, going in companies, and taking their stand in the streets and public places, where they sang with their staves in their hands, and their hats and mantles covered with shells and painted images of various colours, formed a kind of spectacle which pleased the public of that day, and at Paris excited the piety of some of the citizens to raise a fund for purchasing a proper place in which to erect a stage whereon these performances might be regularly exhibited on holidays, as well for the instruction of the people as their entertainment. This appears to have been the origin of the society at Paris called the Brethren of the Passion. In 1402 Charles VI. authorised these exhibitions by letters patent: the Premonstratensian monks gave the use of the great hall of their convent, and a stage was constructed in it upon which the fraternity enacted scriptural pieces. The ecclesiastics crowded to these exhibitions; stages arose in every province; and the *mystères* were so much relished, that on holidays the hour of vespers was hastened, that the people might have more ample time to be present at the play. The brethren, to vary the attractions of the performance, added a sort of farcical interludes or other pieces of a merely worldly character, the enacting of which, however, careful of their own histrionic dignity, they delegated to a junior society called that of the *Enfans sans Soucis*. These latter pieces, in allusion to their burlesque and buffoon character, were denominated *sottises* or *sotties*.

The stage upon which the mysteries were played consisted of several scaffoldings one above another: the most elevated of all represented heaven; that immediately beneath it, earth; a third, still lower, the palace of Herod, the house of Pilate, &c.; and hell, which was at the bottom and in front, was figured by the gaping mouth of a dragon, which opened and shut as the devils went in and out. On each side were seats rising in steps one above another.

which the actors rested when they were not upon the stage, a contrivance not very favourable to scenic illusion; and at the back was a recess, with curtains drawn across it, for the exhibition of such matters as were supposed to take place in the interior of a house.

Among the French, as elsewhere, the Passion was the primary, the most constant, and most solemn subject of these representations, the parts of Christ on the cross, Judas hanging himself, &c., being all played by real persons, sometimes at the actual peril of their lives. It seems to have been owing chiefly to the efforts of the early reformers to diffuse a knowledge of the Scriptures among the people that the Romish ecclesiastics throughout Europe, as one means of securing the fidelity of their flocks, proceeded zealously to extend the field of the religious representations so as to embrace the whole series of Old and New Testament history, or as much of that history as they deemed it prudent to disclose to the multitude. This zealous exertion on the part of the Catholic clergy was supported by all the authority of the Catholic princes. Thus we find that in 1541, under Francis I., the performance of a grand mystery of the Acts of the Apostles was proclaimed with great solemnity under the royal authority, and acted at Paris in the course of many successive days, before the nobility, clergy, and a great concourse of the people, in the Hôtel de Flandres. These plays, written in French rhyme by the brothers Greban, were printed in 2 vols., folio, black letter, under patent of the king to one Guillaume Alabat, of Bourges. The dramatis personæ are, God the Father, the Son, and the Holy Ghost; the Virgin and Joseph; archangels, angels, apostles, and disciples; Jewish priests, emperors, philosophers, magicians, Lucifer, Satan, Beelzebub, Belial, Cerberus, and a multitude of other celestial, terrestrial, and infernal personages, amounting altogether to nearly five hundred. The subjects of these plays are chiefly scriptural; but many of them are from apocryphal New Testament subjects, and the whole forms a strange medley of sacred and profane history. This grand performance was executed, not by any standing company, but by actors selected from the people at large after trial of the merits of the respective candidates. In the present instance, the proclamation notified 'that all should be, on the feast of St. Stephen, the first holiday in Christmas following, in the hall of the Passion, the accustomed place for rehearsals and repetitions of the mysteries played in the said city of Paris, which place, being well furnished with rich tapestry, chairs, and forms, is for the reception of all persons of honest and virtuous report, and of all qualities therein assisting, as also a great number of citizens, merchants, and others as well clergy as laity, in the presence of the commissioners and judicial officers appointed and deputed to hear the speeches of each personage; and these are to make report, according to the merit of each, as in such case required, as to which have a gracious reception; and from day to day, every day so to continue to do until the perfection of the said mystery.'

Among the numerous legendary pieces, one of the most curious extant is 'The Mystery of the Knight who gives his Wife to the Devil,' (Le Mystère du Chevalier qui donne sa Femme au Diable; but the most universally popular of them all seems to have been that of the miraculous host, or consecrated wafer, tortured by a Jew at Paris, commonly called 'Le Mystère de la Sainte Hostie,' two several versions of which exist in black letter.

After the *mysteries* and the *soties*, and during their continuance, came the *moralités* and the *farces*, of which the clerks of the Basoche were the inventors. These clerks were the young assistants of the procureurs, or solicitors, to whom Philippe le Bel granted the privilege of choosing from among themselves a chief, to be called their king, to have supreme jurisdiction over their body, and even to coin money for currency among the clerks. Francis I., in requital of the service rendered him by the king of the Basoche and 6000 of his clerks in marching against the revolters of Guienne, presented them, in 1547, with an extensive promenade ground, bordering on the Seine, which thence took the name of *Pré aux Clercs*. As early as the commencement of the fifteenth century, the king of the Basoche used every year, in July, to make a review of his clerks, divided into twelve bands under as many captains; after the review, they went and offered their salutations to those gentlemen at the head of the legal profession who composed the parliament of Paris; and then they went and performed a morality or a farce. The brethren of the Passion having the exclusive privilege of acting mysteries, the clerks were driven to the invention of the moralities, which were purely allegorical pieces personifying the vices and virtues. The farces and the soties, on the other hand, took a satirical turn, the success of which soon carried the authors to licentious extremes. The public calamities and violent political dissensions of the reigns of Charles VI. and Charles VII. favoured this tendency: the two leading parties, the Armagnacs and the Burgundians, had each its part, and insulted each other by turns upon the stage. When public order was restored, the royal authority availed itself of the fair pretext which these satirical excesses afforded to suppress this exclusively popular stage altogether: the clerks were forbidden to play either farce, sotie, or morality, on pain of flagellation and banishment. This suspension continued until the reign of a prince who was less afraid to hear the truth. 'The good king Louis XII.,' says the historian Bouchet, 'afflicted that in his time he could find nobody to tell him the truth, wherefore he could not know how his kingdom was governed, to the intent that the truth should find its way to him, he gave liberty to the stage, and willed that upon it should be freely acted the abuses that were committed in his court and kingdom; thinking thereby to be acquainted with many things which it would otherwise be impossible for him to hear of.' He did indeed hear some things of a kind rather novel to royal ears, for the players represented him as mean and miserly. This good-natured king, it is true, only laughed at them; but his peculiar relish for homely truths was not likely to predominate among his successors; and accordingly we find that this renovated satirical liberty of the clerks brought on them numerous persecutions, which, however, they seem to have braved at first with something like the daring of an *Aristophanes*.

The society of the *Enfans sans Souci*, too, already mentioned, had been established under Charles VI., had been authorised by patent, and had suffered political oppression. Louis XII. took them likewise under his protection; and their most celebrated sotie, entitled 'The Abuse of the World' (L'Abus du Monde) is attributed to the historian Bouchet above quoted. Their farces have been more celebrated, especially that of 'Pathelin,' whose name has ever since been proverbial in France. The best writers of the beginning of the sixteenth century speak of it as a work enjoying the highest reputation; and in recent times it has been revived in the shape of a modern adaptation, by Brueis and Palaprat.' The characters are—Pathelin, a lawyer with little practice; Guillemet, his wife; Guillaume, a draper; Thibaut Aignelet, a shepherd; and the judge; and the humour of the plot consists chiefly in the droll expedient by which the lawyer, after using it to outwit his neighbour the draper, is outwitted by his client the shepherd. But the dialogue itself, written in octosyllabic rhyme, is full of humour; and from one passage it may be mentioned that Lafontaine has taken his charming fable, 'Le Renard et le Corbeau.' This piece, with all its levity, is very interesting, as one of the most truly original and national productions of the early French stage, and therefore as one of those which gave promise of something like that spontaneous and vigorous dramatic growth which was springing in one or two neighbouring countries. But the three several kinds of theatre which we have particularized were fated soon to sink under the repeated blows aimed at them by the government. This strong tendency, however, of the infant stage of France to freedom of political animadversion, and the early jealousy and arbitrary repression of theatrical liberty on the part of the French crown, should be clearly and constantly borne in mind, in order to understand and appreciate that very peculiar course which dramatic composition took in that country, and which the predominance of French taste made for so long a period ascendant in Europe. To this determined stifling by the government of the first germs of a truly national drama we ought to attribute the immediate and general success of the earliest French imitations of the ancient theatre that were actually brought upon the stage. The national taste, the *romantic* tendencies of which had decidedly manifested themselves, was not suffered to develop itself freely. Theatrical enjoyment, since they first tasted it, has ever appeared a more imperious *want* of the French, and of the Parisians in particular, than of any other people, excepting perhaps the ancient Athenians; and when, at the period in question, their rulers had violently crushed every other species of dramatic production, they eagerly welcomed those only forms of it which those rulers would vouchsafe to let them have.

Some French translations from Sophocles and Euripides already existed, but nobody had yet thought of adapting them to the stage; indeed they were little to the purpose either of the brethren of the Passion or the performers of the Basoche. A young gentleman, Etienne Jodelle, seigneur of Limodin, who had studied the antient dramatists both in their original works and in the Italian imitations of them, was the first to avail himself of the opportunity thus afforded, by bringing forward his 'Cléopatre Captive', a tragedy in five acts, with choruses after the manner of the Greeks. His friends got a stage erected in the Hôtel de Reims at Paris; two poets of note in that day, Remi Belleau and Jean de la Péruse, undertook the principal male parts; and Jodelle himself, trusting to his youth, his personal beauty, and histrionic talent, personated Cleopatra. Henry II. and his court, seeing plainly that while this dramatic innovation would gratify in some degree the craving appetite of the Parisian public for theatrical exhibitions, there was little danger of its contributing to develop those truly national feelings which it was now the confirmed policy of French administrations to discourage, warmly patronized this performance; and all Paris, delighted to have once more a theatre of some sort, followed the court's example. This piece is remarkable only as being the first of its class, and so commencing a new æra of French dramatic history. Jodelle was more successful in his comedy entitled 'L'Abbé Eugêne,' wherein, still emulating the Italian imitations of the antients, though in the manners of his own age and country, he exhibits a libertine ecclesiastic intriguing with the wife of a simple man, and his chaplain acting the honourable part of go-between in the affair. There is much comic power and sprightliness in this play, to which succeeded his second tragedy of 'Didon,' the fate of which is not known.

From Jodelle down to Corneille, French dramatic art made little progress; but dramatic productions, in the same line of classic imitation, abounded, especially in tragedy, the heroes of which were constantly taken from Greek or Roman history, or at most from that of the Turks, who were first introduced upon the stage by Gabriel Bonnin. At this early period, indeed, of the French theatre, that singular dramatic prejudice seems to have firmly established itself, that the pomp of tragic style could not be well supported on the stage, except both costume and character were either Greek, Roman, or Mussulman. The Alexandrine verse, too, was almost invariably used; though once, and but once, was acted a prose tragedy of 'Sophonisba,' by St. Gelais. The versified comedies of the same period have nothing remarkable; but in 1562, the two brothers De la Taille began to accustom the French public to comedies in prose. Nicolas Filleul attempted unsuccessfully to naturalize pastoral poetry on the stage. All these writers had still to contend against the privileged possessors of the stage. There was not in all France a single company regularly trained for the new class of performances. Under Henry IV., the brethren of the Passion had obtained almost a revocation of the edict of 1548, which prohibited them from enacting religious subjects; but the public had now little relish for these rude exhibitions, so that the fraternity found themselves obliged to let their theatre to a more modern class of performers. The other dramatic societies endeavoured to adopt their antiquated pieces in some degree to the modern taste; and thus out of their old moralities they contrived to make pastoral pieces wherein the Church was a bride, and Christ the bridegroom. Robert Garnier rose in tragedy some little above his predecessors in elegance and dignity, and was so much celebrated in his own day as to have the pre-eminence of his tragic powers commemorated in one of the best sonnets of Ronsard. Though he usually drew abundantly from Sophocles, Euripides, and Seneca, he showed in some of his pieces more original vigour, as for instance in 'Les Juives,' taken from Jewish history. The prose comedy of intrigue (for the comedy of character had not yet appeared) continued to be cultivated with vigour and success by Pierre de l'Arivey, contemporary with Garnier. The Jesuit father Fronton attempted a tragedy on the grand national subject of 'Jeanne d'Arc,' but without success. At length, in 1600, two permanent theatres were erected at Paris, one of which was occupied by a company which took the title of *Troupe de la Comédie Française*: the other company established itself in the quarter of Paris called the Marais, with the consent of the brethren of the Passion, and thus the old stage of the middle ages was finally extinguished in the French metropolis. Still, however, as before, the theatre took its tone from the exclusive taste of the court; and from the commencement of the sixteenth century till the appearance of Corneille, scarcely anything was brought forward but either tragedy or that very harmless description of farce which, it was thought, might without much danger be conceded to the popular taste: this is the grand æra of the popularity of the well-known burlesque personages *Gros Guillaume*, *Tabarin*, and *Turlupin*, whose merry reign was protracted even into the age of Louis XIV.

Most of the tragedies of this period flowed from the exhaustless pen of Alexandre Hardy, a poet employed by the company which had succeeded to the privilege of the brethren of the Passion, and who wrote more than eight hundred dramatic pieces, of which forty remain. Possessed of very extensive reading, Hardy made some efforts to deviate from the beaten track of his predecessors: he ventured in some instances to compose what he called tragi-comedies, one of which is founded on a tale of Cervantes; but his genius was not equal to his boldness and facility. The dramatists who immediately preceded Corneille and Molière were Mairet and Tristan, the former of whom, like so many before and after him, tried and failed in the eternal subject of Sophonisba; while the latter failed yet more signally in the Jewish subject of Mariamne.

We come now to the age of Louis XIV., of which Cardinal Richelieu was the real creator in literature, as well as in politics. This great artificer of despotism, whose genius raised the French crown to a height and a solidity of irresponsible power, for the abuse of which it has dearly paid in later times, had the sagacity, which many powerful ministers have wanted, to perceive that, in order to consolidate his favourite political fabric the more, it was worth while to permanently organize the literary talent of the country in the service of the court. 'Leave us at least the republic of letters,' said Napoleon once to a poet who was showing him too much of the courtier: but Richelieu understood the matter differently; and arranged it so that his literary senate should ever remain as subservient as Napoleon's own political senate was under his imperial reign. The court, it is true, did not directly dictate to the cardinal's chosen forty in what quarters they should bestow their praise or censure; but things were so ordered that the men to whom the protectorship of letters was officially entrusted should always share more or less the tastes and opinions of the government: by the court it was that they were paid; under the eyes of the court they held their sittings; it was by court intrigue that a vacant chair was to be obtained; and every writer was ambitious of the honour.

Such was the predominant influence under which Corneille began his dramatic career. To enter the academy, he must please the court; and to please the court, he must defer to the literary dictation of the academy. Now, in dramatic composition, the academy not merely recommended adherence to the so-called rules of Aristotle, but prescribed their observance with the greatest rigidity. The same Aristotelian maxims were, indeed, in the present instance, little more than a pretext; but the far-sighted cardinal was well aware how admirably they were adapted to facilitate that strictness of surveillance, and that repression of everything like popular enthusiasm, to which his system required that this grand focus of public sympathies, the drama, should be subjected. There was, however, one serious obstacle to the complete establishment of his dramatic system, viz. the general estimation of the Spanish literature and the Spanish drama in particular, then as ascendant in Europe as those of France have been since. Familiarly cultivated and highly relished as the language and literature of Spain then were at Paris, any young dramatic writer of vigorous talents must have found himself, with all his anxiety to please the court, rather disagreeably circumstanced between the academy and its classic code on the one hand, and the successful example of the most popular European dramatists on the other. Corneille produced six comedies and one tragedy after the antique models, before he ventured on any bolder attempt. Their great superiority to elegance and dignity of style over those of all his French predecessors, who in this respect had remained so far behind the Italians and the Spaniards, would alone have been sufficient to ensure their success. He next produced a comedy in the Spanish taste; and shortly after ventured to give a yet more striking evidence of his romantic tendencies in his tragedy of *Le Cid*.

This vigorous experiment brought the academic code and the public taste fairly into collision; the latter decided loudly for the author, and under any other political system might have effectually supported and encouraged him in his independent views of art. But the league of the academy with the court was too strong even for his masculine resolution; and in two of his best pieces, which next followed, 'The Horatii' and 'Cinna,' he returned to the Roman tragedy. In comedy, however, Corneille still borrowed avowedly from the Spanish stage. In his tragedy of 'The Cid,' he had imitated two Spanish dramatists, Guillen de Castro and Diamante, who had both successively treated the same subject; and now, in his comedy of 'The Liar' (Le Menteur), he frankly and warmly acknowledged his obligations to a Spanish original, 'The Doubtful Truth' (La Verdad Sospechosa), of Don Juan Ruiz de Alarcon, which was long attributed by some to Lope de Vega, by others to Francesco de Rojas, and of which Corneille himself did not know the real author. When he afterwards produced the 'Sequel to the Liar' (La Suite du Menteur), he owned that he drew it also from a Spanish source; we find his original in Lope de Vega's 'Loving without knowing whom' (Amar sin saber á quien). Fontenelle himself, so careful of his uncle's fame, tells us, in speaking of another of his pieces, that it is taken almost entirely from the Spanish; 'for,' says he, 'at that time nearly all the plots were taken from the Spaniards, on account of their great superiority in those matters.' But Corneille's deep study of and sympathy with the Spanish dramatists appear also in the compositions more peculiarly his own; those chivalric manners, those lofty sentiments and swelling images, with which he was so familiarized, are discoverable throughout; his very Romans belong rather to the middle ages than to the old republic, and, indeed, are perhaps hardly so much Roman as they are Spanish. However, he kept himself in a feverish and constrained submission to the academy, for which he was at last appropriately rewarded with a seat among its members.

The rise of the French comedy of character, of which Molière is the great representative, is yet more clearly deducible from the Spanish source than that of their classic tragedy. The marked separation between tragedy and comedy was a fundamental article of the academic code. To that most numerous order of writers who are fitted to deal only with one of the two great classes of dramatic elements, the comic and the serious, such an injunction appears indeed rather as an encouragement than as a shackle or a clog; but when this prohibition of the mixed or truly romantic species falls upon a genius so bold and comprehensive as that of Corneille, it cripples the noblest of his powers, and shuts out from him the richest of his resources. A writer, however, having this depth and compass of genius, with that constant tendency to seriousness of purpose which ever attends them, finds it a less painful effort to abstain from the comic intermixture in tragedy than to exclude the passionate and the pathetic from comedy; and will thus, like Corneille, devote himself less to the latter than to the former. But Molière was born for the comic only, and could therefore indulge his dramatic tastes and propensities with comparatively little restraint. In his first pieces, written for a strolling company, he imitated the lively trickery and buffoonery of the Italian farces, a species of composition for which, throughout his career, he showed a strong inclination. Next, in 'L'Etourdi' and 'Le Dépit Amoureux' he imitated the Spanish comedy of intrigue. And how he was led, by Corneille's adaptation from the Spanish, to the comedy of character, wherein he was destined to establish his fame so solidly and so durably, he himself tells us in a letter to Boileau, recently quoted by Martinez de la Rosa. 'I am much indebted,' he says, 'to "Le Menteur." When it was first performed, I had already a wish to write, but was in doubt as to what it should be. My ideas were still confused, but this piece determined them. In short, but for the appearance of "Le Menteur," though I should no doubt have written comedies of intrigue as "L'Etourdi" or "Le Dépit Amoureux," I should perhaps never have written "Le Misanthrope."' Nor was it alone through the medium of Corneille that Molière, in his maturer compositions, received the influence of the Spanish stage: in various instances he borrowed directly from it, especially in his secondary pieces.

It is remarked by Schlegel, that when Molière in his farcical pieces did not bore on foreign invention, he still appropriated to himself the comic masques of other countries, especially that of the Italian buffoonery. 'He wished to introduce a sort of masked characters without masks, who should recur with the same name. They have never however been able to become properly domiciliated in France; because the flexible national character of the French, which imitates every mode that is prevalent for the time, is incompatible with that odd originality of exterior to which humourists and singular individuals give themselves carelessly up in other nations, where all are not modelled by the social tone after the same manner. As the Sganarelles, Mascarilles, Scapins, and Crispins have been allowed to retain their uniform that everything like consistency may not be lost, they are now completely obsolete on the stage. The French taste is, generally speaking, very little inclined to the self-conscious, droll exaggerating, and arbitrary comic; because these descriptions of the comic speak more to the fancy than to the understanding. We do not mean to censure this, nor to quarrel about the respective merits of the different species. The low estimation in which the former are held may perhaps contribute the more to the success of the comic of observation; and in fact the French comic writers have here displayed a great deal of refinement and ingenuity; herein consists the great merit of Molière, and it is certainly very distinguished.' The highest refinement and delicacy of the comic of observation, however, consists in this, that the characters disclose themselves unconsciously by traits which involuntarily escape from them; whereas long argumentative disquisitions between the several personages are frequent in all the most admired pieces of Molière, and nowhere more so than in 'Le Misanthrope,' which has always been cited by the French critics of the old school as the great model of French comedy; close by which they rank the 'Tartuffe,' 'Les Femmes Savantes,' and 'L'Ecole des Femmes' of the same author. Molière's greater comedies, in short, are too didactic, too expressly instructive; whereas the auditor should only be instructed covertly and incidentally. It should be observed that 'The Miser' of Molière ('L'Avare'), some scenes of which are taken from Plautus, is the earliest instance of a five-act French comedy written in prose.

The restrictions which cramped the genius of Corneille comfortably fitted that of Racine, and contributed to render him in every sense the favourite tragic poet of the court of Louis XIV. He seemed born to carry to the highest possible perfection what we must call, for want of a clearer term that should be equally appropriate, the Frenchification of Greek tragedy. He managed with consummate art and most felicitous ease to flatter at once the dramatic taste and the moral temperament of the court. The very anomaly which his works presented, in giving to antique heroes the tone and the language of the French gallantry of his time, thus became one of their highest recommendations. Above all, his excellence in investing the expression of love, real or pretended, with conventional dignity and delicacy, was a merit invaluable in the eyes of Louis and his courtiers of both sexes. For tenderness and elegance of expression, Racine is indeed unrivalled among the French dramatists of the classic school. His high powers of this kind made him also one of the ablest appropriators and improvers of the eloquence of preceding writers in numberless scattered passages of his own productions. Among his pieces on Grecian subjects, 'Andromaque' is that in which he displays the most originality: in this tragedy, says Schlegel, 'he expressed the inward struggles and inconsistencies of passion with a truth and energy which had never before been heard on the French stage.' And respecting 'Phèdre,' the same critic, looking with no partial eye upon the masters of the French classic school, observes—'How much soever in this tragedy Racine may have borrowed from Euripides and Seneca, and how much soever he may have spoiled the former and not improved the latter, still it was a great step from the affected mannerism of his age to a more genuine tragic style. When we compare it with the 'Phèdre' of Pradon, which was so well received by his contemporaries, for no other reason [illegible] whatever of the antients was discernible in it, but every thing reduced to the scale of a fashionable miniature-portrait for a toilette, we must entertain the higher admiration for the writer who had so strong a feeling for the antient poets, had the courage to connect himself with them, and dared to display so much purity and unaffected simplicity in an age of which the prevailing taste was every way vitiated and unnatural.' Racine's 'Britannicus' is one of those among French classic tragedies which have the highest claims to historical accuracy and delicate discrimination of character, in the persons of Nero, Agrippina, Narcissus, and Burrhus. 'In "Athalie,"' says his German critic, 'he exhibited himself for the last time, before taking leave of poetry and the world, in his whole strength. It is not only his most finished work, but I have no hesitation in declaring it, of all the French tragedies, to be the one which, free from all mannerism, approaches nearest to the grand style of the Greeks. The chorus is fully in the sense of the antients, though introduced in a different manner for the sake of suiting our music and the different arrangement of our theatre. The scene has all the majesty of a public action: expectation, wonder, and keen agitation, succeed each other, and constantly rise with the progress of the drama: with a severe abstinence from everything extraneous, there is a display of the richest variety, sometimes of sweetness, but more frequently of majesty and grandeur. The inspiration of the prophet elevates the fancy to flights of more than usual boldness. The signification is that which a religious drama ought to have; on earth, the struggle between good and evil; in heaven, the wakeful eye of Providence darting down rays of decision from unapproachable glory. All is animated by one breath, by the pious inspiration of the poet; of the genuineness of which neither his life nor this work will allow us to entertain a doubt. This is the very thing in which so many pretended works of art of the French are deficient: the authors have not been inspired by a fervent love for their subject, but by the desire of external effect; hence the vanity of the artist everywhere breaks forth, and casts a damp over our feelings.'

In the history of French tragedy, it is little gratifying to pass from Racine to Richelieu's favourite, the Abbé D'Aubignac, who revenged himself for the failure of his tragedy of 'Zénobie' by censuring bitterly the works of Corneille. Racine himself found a similar adversary in Nicolas Pradon, who wrote a rival tragedy of 'Phèdre,' which Madame Deshoulières was not ashamed to extol above Racine's, and a 'Régulus,' which the praises of St. Evremond and Madame de Sévigné have not saved from oblivion. Lafosse profited somewhat better by Corneille's example in the dignity and intelligence which he threw into his otherwise feeble 'Manlius,' which Talma's acting recently made so popular. As for the tragedies of Duché, Campistron, the abbé Pellegrin, the abbé Longepierre, and others, suffice it to say, that they brought little fame to their authors, and no advancement to the art. Thomas Corneille ventured to write tragedy after his brother, and wrote it very 'correctly.' Crébillon was by far the most successful tragic writer that arose in the interval between Racine and Voltaire; but his reputation, rapidly acquired, resting on an unsound basis, declined almost as rapidly; ever striving rather to horrify than to affect, the unnatural exaggeration both of situation and character into which he was constantly betrayed was a defect too serious to be redeemed even by the great force and mastery of style which he displays.

This species of composition occupied no small proportion of the wonderful versatility of Voltaire; and although he was irresistibly led to press the tragic muse into the service of the unceasing warfare which he waged against superstition, fanaticism, and hypocrisy, and might even owe some portion of his theatrical success to that circumstance, yet he has earned, in universal estimation, a place beside Corneille and Racine as a dramatic artist. The same independence of genius and spirit which made him rebel against other conventionalisms of graver import, prompted him to break through some of the more irksome part of the restrictions imposed by the established dramatic system. He insisted on treating subjects with more historical truth, and raised once more to the dignity of the tragic stage the chivalrous and Christian characters of modern Europe, which, ever since 'The Cid' of Corneille, had been altogether excluded from it. Thus his Lusignan and Nerestan, in 'Zaire,' are among his most true, affecting, and noble creations; and the plot of his 'Tancrède' is founded on as pure motives of honour and love without any ignoble intermixture, as entirely consecrated to the exhibition of chivalrous sentiments, as that of 'Le Cid' itself. In 'Alzire,' Voltaire went still farther, treating a subject in modern history never before touched by his countrymen; and as in the pieces already mentioned he had contrasted the chivalrous ideas and motives with the Saracenic, so here, with great historical truth and noble pathos, he has ventured to exhibit the old Spaniards in opposition to the Peruvians. 'It is singular enough,' remarks Schlegel, 'that Voltaire, in his restless search after tragical materials, has actually completed the circumnavigation of the globe; for, as in 'Alzire' he exhibits the American tribes of the other hemisphere, in his 'Dschingis Kan,' he brings Chinese upon the stage from the farthest extremity of ours, who, from the faithful observance of their costume, have the appearance of comic or grotesque figures.' 'As the French,' observes our German critic in another place, 'are in general better acquainted with the Romans than with the Greeks, we might expect the Roman pieces of Voltaire to be more consistent, in a political point of view, with historical truth, than his Greek pieces are with the symbolical nature of mythology. This, however, is the case only in 'Brutus,' the earliest of them, and the only one which can be said to be seriously planned. Voltaire sketched this tragedy in England: he had learned from "Julius Cæsar" the effect which the publicity of republican transactions is capable of producing on the stage, and so endeavoured to hold in some degree a middle course between Corneille and Shakspeare:' the latter of whom, we may add, he acquired, or at least evinced very little in the way of due appreciation. On the whole, however, though Corneille is deemed to have expressed heroic sentiments with greater sublimity, and Racine the natural emotions with greater sweetness, it is admitted that Voltaire introduced moral motives into the drama with greater effect, and displays a more intimate acquaintance with the original relations of the mind.

Only the first and the last of these three great masters of the French tragic stage may be said to have been fruitful in this class of productions. Racine, however, has the advantage, that, excepting his first youthful attempts, the whole of his pieces have kept possession of the stage and of the public favour, while many of Corneille's and Voltaire's which pleased at first are not now even so much as read, so that it has become common to publish selections from their dramatic works under the title of *Chefs-d'œuvre.*

Voltaire seems to have come too late, even with his moderate attempts at reformation of the dramatic system. The prejudice which gave such disproportionate importance to the observance of external rules and proprieties was already immovably established; nor was it until after the great political change which took place towards the close of the last century that any considerable effort was [illegible] made to break through the academic limitations. We shall therefore pass briefly over the half century of French dramatic history which immediately followed the age of Louis XIV., notwithstanding that, during that period, upwards of fifty authors, of more or less celebrity, wrote for the higher departments of the stage, of whose pieces the greater part were actually performed, many of them with high temporary and some few with permanent success. In tragedy we shall mention nothing more than the names, for the most part now obscure, of Lagrange, Chancel, Lamotte, Piron, Lanoue, Guimond de Latouche, Châteaubrun, Saurin, and Debelloy.

La Harpe, whose critical labours had so extensively injurious an influence throughout Europe in enforcing the classic system in all its rigidity, contributed nothing to recommend it by his own tragic compositions, which, while they are among the most correct in style, are among the most frigid in sentiment and effect, although, indeed, he has the merit of having presented, in his 'Philoctète,' the most exact imitation of a Greek tragedy that France has produced. On the other hand, Marie Joseph Chénier, who, flourishing in the early days of the Revolution, wrote, like the tragic poets of Greece, in the midst of free men, and with like ardour stimulated them to the love of liberty, made nearer approaches than any of his predecessors to the tragic strength and fervid diction of Voltaire. His 'Charles the Ninth, or the School for Kings' (Ecole des Rois), from which the people, too, might draw an important lesson, was that among his pieces which produced the greatest excitement in the public mind. So far, however, from [illegible] durately blackening the character of the young king, he casts chiefly upon his mother-in-law and the cardinal of Lorraine the odium of the St. Bartholomew massacre, the horrors of which he depicts with unsparing energy. In his '*Tibère*' he no less forcibly exhibits the misery of a hypocritical tyrant, as he does that of a fanatical one in his 'Philippe II.,' in some parts of which he has happily, but not servilely, imitated Schiller. It was in his 'Fénelon,' wherein he paints the miseries of the cloister, and shows Fénelon's angelic piety in admirable contrast with the tyrannical passions which possess the other characters, that the young Talma, whose histrionic powers Chénier had already divined, began to make himself known to the public. Ducis, possessing brilliant powers of poetic execution, portrayed the Arabian manners, in his tragedy of 'Abufar,' with great warmth of imagination and originality of style; but his highest claim to dramatic celebrity rests upon the endeavour, which he made with considerable success, to bring his countrymen acquainted with the masterpieces of Shakspeare. Having high qualifications for this task, it is to be regretted that he felt himself bound to cramp and maim his adaptations by reducing them within the *French* dramatic regulations; when, by copying his English original more closely, he might have made himself a creator in French literature: still his work was most praiseworthy and important, as the first able and cordial attempt to give the French public some remote idea at least of the real merits of that transcendent genius whom Voltaire, though he made some efforts to appreciate, had remained so far from understanding as to call him deliberately 'a drunken savage.' The name of M. Arnault appears already in the dramatic annals of that period. His first tragedies, 'Marius à Minturnes,' 'Lucrèce,' and 'Cincinnatus,' with their energetic simplicity, are in spirit and design truly antique. Gabriel Legouvé's 'Death of Abel' (*Mort d'Abel*) was a hazardous but successful attempt to make an antediluvian subject acceptable on a modern stage, to which he had been encouraged by the popularity which Gessner and his poetry then enjoyed. The same author ventured to exhibit, not unsuccessfully, in 'Epicharis et Néron,' the latter days of Nero, the opening of whose career is shown in one of the masterpieces of Racine. 'Les Templiers' of M. Raynouard, founded on the destruction of the order of Knights Templars in the reign of Philippe le Bel, is much more remarkable for art and correctness of structure and execution than for poetic vitality; but those merits, added to the powerful interest of its national subject, made it highly successful.

Some of the comedies of Boursault, a younger contemporary of Molière, have kept possession of the stage: they are all of the secondary description which the French call *pièces à tiroir*, of which Molière himself, in his 'Fâcheux,' gave the first example. This kind, in the accidental nature of the scenes, which are strung together on one common occasion, bear a resemblance to the *mimi* of the ancients: they are particularly favourable for the display of the mimetic art in the more limited signification of the term, as it is *one* and the same player that re-appears throughout in a fresh *character* and a different disguise. The want of dramatic movement however in such productions requires they should be short, whereas Boursault's pieces, though otherwise possessing considerable merit, are drawn out to the wearisome length of five acts.

After Molière's death, a considerable time elapsed before the appearance of Regnard, to whom the second place among the French comic writers has usually been assigned. He divided his labours between the Italian theatre, which still flourished under Gherardi, and for which he sketched fine French scenes, and the composition of regular comedy in verse. His earliest play, 'The Gambler' (*Le Joueur*), is the most esteemed: it is a picture after nature, drawn strongly, but without exaggeration, from his intimate acquaintance with the subject resulting from his personal experience. His 'Absent Man' (*Le Distrait*), running exclusively upon the exhibition of that characteristic defect, is necessarily tedious: the author has here done little more than dramatize a series of anecdotes which La Bruyère had assembled under the name of a particular character. His 'Légataire Universel,' though exhibiting more comic power, fails through a deficiency of moral feeling. La Harpe however declares it to be a masterpiece of comic pleasantry; whereupon Schlegel remarks: 'It is in fact such a subject for pleasantry as would move a stone to pity; as enlivening as the grin of a death's head. What a subject for mirth!—a feeble old man in the jaws of death, who is teased by young profligates for his property, and has a false will imposed on him while lying insensible, as is believed, on his death-bed.'

A contemporary of Regnard, the actor Legrand, was one of the first comic poets of his nation who acquired celebrity in versified afterpieces, a kind in which the French have since produced many elegant trifles. His posthumous fame however has been far inferior to that of Regnard; although there is one piece of his, 'Le Roi de Cocagne,' a sprightly farce in the wonderful style, overflowing with a quality then rarely found in the French drama, a native and fanciful wit, animated by the liveliest mirth, which sports about all sorts of subjects in the most frolicsome yet harmless manner. But the French critics of the old school have generally been indifferent or unjust towards any impulse of genuine fancy, confounding, it should seem, the levity of jocularity with that of mere shallowness, which has been so much complained of in their countrymen.

The eighteenth century produced a number of comic writers in France of the second and third rank, but no genius capable of advancing that department of the dramatic art a step farther, and thus the belief in the unapproachable excellence of Molière became yet more firmly fixed. 'Want of easy progress,' observes Schlegel, 'and the use of lengthened disquisitions in stationary dialogue, have characterised more or less every writer since the time of Molière, on whose regular pieces the conventional rules applied to tragedy have had an indisputable influence. French comedy in verse has its tirades as well as tragedy; which circumstance contributed to introduce into it a certain degree of stiff etiquette. The comedy of other nations has generally descended, from motives which we can be at no loss to understand, into the circle of the inferior classes; but the range of the French comedy is nearly confined to the upper classes of society. Here also we trace the influence of the court as the central point of the whole national vanity. Those spectators who in reality had no access to the great world, were flattered by having marquises and chevaliers brought before them on the stage; and the poet himself, while satirising the fashionable follies, endeavoured to snatch something of that privileged tone which was esteemed so enviable. Society rubs off the salient angles of character; its peculiar entertainment consists in detecting the ridiculous; and hence we acquire the faculty of being on our guard against the observations of others. Thus it is that the natural, cordial, and jovial comic of the inferior classes is laid aside, and another description, the fruit of polished society, and characterized by the insipidity of such an aimless way of living, comes to be substituted in its place. The object of these comedies is no longer life, but society; that perpetual negotiation between conflicting vanities which never ends in a sincere treaty of peace. The embroidered dress, the hat under the arm, and the sword by the side, essentially belong to them; and the whole of the characterization is limited to the folly of the men and the coquetry of the women. The insipid uniformity of these pictures was unfortunately too often seasoned by the corruption of moral principles which, especially after the age of Louis XIV. till the middle of the century, under the Regency and Louis XV., it became the fashion openly to avow. In this period the favourite of the women, the *homme à bonnes fortunes*, who in a tone of satiety boasts of the multitude of his conquests, too easily achieved, was not a character invented by the comic writers, but an accurate portrait from real life, as is proved by many memoirs of the last century, even down to those of a Besenval. We are disgusted at the unrivalled sensuality of the love intrigues of the Grecian comedy; but the Greeks would have thought the intrigues with married women in the French comedy, entered into merely from giddy vanity, much more disgusting. Limits have been fixed by nature herself to sensual excess; but where vanity assumes the part of a sensuality already deadened and enervated, it gives birth to the most hollow *corruption*. If, in the constant ridicule of marriage by the petit maîtres, and in their moral scepticism, especially with regard to women, the poets merely intended to censure a prevailing depravity, the picture is not therefore the less dangerous. The great or fashionable world which in point of numbers is the small, but which considers itself as alone of any importance, can hardly be improved by it; and the example is but too seductive for the other classes, from the brilliancy with which the characters are surrounded. But in so far as comedy is concerned, this deadening corruption is by no means entertaining; and in many pieces in which fools of quality give the tone, as in the 'Chevalier à la Mode' of Dancourt for instance, the picture of complete moral dissoluteness, which, though true, is both unpoetical and unnatural, is not only wearisome in the extreme, but most decidedly disgusting.

'From the number of writers to whom this charge principally attaches, Destouches and Marivaux, fertile, or at least diligent, comic poets, the former in verse, the latter in prose, deserve to be excepted. They acquired considerable distinction among their contemporaries in the first half of the eighteenth century, but few of their works survived either of them on the stage.

'Two other separate works are named as masterpieces in regular comedy in verse, belonging to two writers who perhaps have here taken more pains, but in other poetical departments have given freer scope to their natural talent—the "Métromanie" of Piron, and the "Méchant" of Gresset. The 'Métromanie' is not without humorous inspiration: in the young man possessed by a rage for versifying, Piron meant in some degree to portray himself; but as we always go tenderly to work in ridiculing ourselves, so, together with the amiable weakness in question, he exhibits in his hero talents, magnanimity, and good-heartedness· but this same tender regard is not peculiarly conducive to comic strength. The "Méchant" is one of those gloomy comedies which might be rapturously hailed by a Timon as serving to confirm him in his aversion to human society, but on social and cheerful minds can only be productive of the most painful effects. Yet, according to the decision of the French critics, these three comedies, "The Vainglorious Man" (Le Glorieux) of Destouches, "La Métromanie" of Piron, and "Le Méchant" of Gresset, are all that the eighteenth century has to oppose to Molière. To Diderot's attempts at dramatic innovation, as they were founded on false views of the objects and conditions of art in general, we shall do no more than allude. And of Beaumarchais, the celebrated of 'Le Barbier de Seville' and 'Les Noces de Figaro,' it may be said, that, under the last days of the monarchy, he assailed the corrupt society of his time with a wit no less caustic, sportive, and subtle, in his dramatic pieces, than Voltaire had employed against it in his lighter tales and essays.

In the overthrow of the *ancien régime* in politics fell the main support of the old dramatic code; yet it is remarkable, though perhaps not wonderful, that many of the warmest and firmest opponents of the former, both then and since, have clung with extreme tenacity to the latter; so strong and so binding is the force of habit, especially of literary habit, so long as the analytic powers have not been brought to bear directly and expressly upon the subject in question. Hence the revolution in French art and literature has followed but tardily the political revolution; and its first promoters have had to contend against the most formidable obstacles. However, they presented themselves early in the field. The stormy days of the Convention, and the saturnalian period of the Directory which followed them, did indeed afford little leisure or encouragement for the cultivation of the liberal arts; but no sooner were the danger and the fear of anarchy removed by the firm and vigorous administration of the Consulate, than the new literary and dramatic ideas began to develop themselves, and, in consequence, a violent war to be waged between the *classicistes* of the old school and the *romanticistes* of the new.

Among the earliest, ablest, and steadiest cultivators of the French romantic drama, the first place seems due to M. Népomucène Lemercier. In his tragedy of 'Agamemnon,' the most perfect work of the kind that had yet appeared since Racine and Voltaire, he strove, with signal success, to combine with felicity of plot and purity of style, more original and striking attractions. He penetrated far beneath the costume and the forms of antiquity, to its inmost soul and spirit: to the numerous personages, so different in their characters and their interests, whom he grouped with admirable skill, he lent their respective habits, manners, and language, with such clear and just discrimination, as to create a class of dramatic beauties, which, at that day, took the French public by surprise, while the consummate art with which they were introduced won their admiration for that which otherwise they would have regarded merely as an audacious innovation. When the first shocks of the Revolution had subsided, and, as we have already observed, literature and art once more found room to breathe, M. Lemercier made a yet bolder step in his devoted cultivat of the *drame*, as the new species was distinctively deno nated by its advocates, who characterized it as a sin adherence to the higher spirit of art, while its oppon stigmatized it as a forced and incongruous mixture tragedy and comedy. In his drama of 'Pinto,' he vent to unfold at once the whole romantic system; it exh the freest intermixture of humorous scenes with gr situations, in a most lively and varied picture of the pop emotions and the protracted anxiety of a band of consp tors, with all the vacillations, the inquietudes, the rev and the bursts of enthusiasm, attendant on similar atten at political change.

We cannot better convey a notion of the course of Fre dramatic art from that time down to the years which mediately preceded the revolution of 1830, and of t manner in which that course was affected by the remark variations of political circumstances, than in the words M. Lemercier himself, writing under the government the Restoration, about the year 1825. (*Revue Europ* No. 5.) 'In former time,' says he, 'urged by that in the public mind which made it seek to quit the acad routine, I strove to create, under the name of *Pinto*, a of *historic play*, wherein the reverse side of the court corations should be presented to the audience; where great and the people should speak, each in their gen language, and show their respective absurdities in con The art was gradually advancing, when its march again embarrassed by the complication of public aff A fatally personal ambition erected the imperial gov ment. Truth gave it umbrage, and therefore silence to be imposed on her interpreters. All progress stopped; all poetic reputation excited suspicion in a thr fold police: we stood aside, and held our peace during concerts of constrained applause. The muses are irre cilable with tyranny: the forced silence of the former always attested the presence of the latter; but their pati ever finds an opportunity to stigmatize this disgrace. A so many checks and vicissitudes, the obstacles accum by thirty years of civil discord are now united against t free progress of art, with shackles imposed by a mistak prudence. The opposing parties, the coteries, proscribe noblest recollections of antiquity through dread of the publican spirit: the church, whose history is so cl mingled in all modern annals, forbids the delineation of her virtues, lest it should lead to that of her cr She proscribes her own sacerdotal costume, which W wears upon the English stage, and the grand-inquis Madrid upon that of Vienna: she shrinks from bei her sacred habit, not only on the cardinal of Lorrain even on the venerable Fénélon. Not more uncom mising was the rigidity with which Robespierre re the purple of royalty and the costume of count or ma A censorship, sprung up under the Empire, is now exe through agents more numerous and more secretly in torial: with such a censorship nothing can be portr nothing can be thought; we must not even dare member anything. Such few sparks of the sacred f yet escape at rare intervals from a vessel so carefully cov up, so thoroughly smothered, go and die out in some committee or some *bureau de surveillance*. Not that is any reason to believe that dramatic literature is dea France; but it is languishing, imprisoned, and ha refuge in most of the other countries of Europe, where same causes oppose to it the same barriers as am ourselves. However, as the people must have spe and as the appearance is to be given them when the r is taken away, the idle are left in possession, not on academies and censured journals, but of theatres—lab manufactories wherein each individual associating h with the mass, contributes the full amount of his mo significant ideas, in order that the police may tolerate and so not prevent him from gaining his livelihood or riching the theatrical storehouse. Hence all this pain of little vices, little oddities, little people, little com place minds; and all these nothings amuse, while take its money, a nation flattered by the little compli which form the customary burden of its theatrical *mérides*. And thus, by the voice of these *muselles*, with permission and according to orders, has it been soled for the loss of its noblest pleasures, and di from its pursuit of glory and liberty by the distractions ministered to its levity. Too long has the blindness parties converted our great theatres into so many fields for the trial of their political strength—so many arenas opened to the frantic impulses of allusion: the lapse of thirty years has not deadened this scandalous strife; and during all this time the censorship, vainly occupied in striving to defeat these malicious contrivances, has sometimes suppressed the most salutary productions, and sometimes inserted into them whole passages favourable to the reigning systems. but the public revenge themselves by rejecting the applications which self-interest has suggested, at the same time that they eagerly lay hold on those which punish this wretched exercise of a power that cannot wisely suppress anything but positive abuses. What, then, can any talent accomplish under chains at once so galling and so depressing? It is cheated of the substance, and has nothing left it but the superficial graces of versification.'

The revolution of 1830 was a victory won for liberty in art as well as in politics. Since then, the higher departments of the French drama, both as to writing and acting, have been in full activity. Among the advocates and emulators of the Shakspearian *drame*, Victor Hugo has hitherto shown himself the foremost, the boldest, and the ablest. In tragedy in the more limited sense, though still of the romantic school, Alexandre Dumas and Alfred de Vigny are the most distinguished. It is the higher comedy that seems at present to be the least flourishing. Meanwhile, the classic reputation of Molière preserves his comedies on the stage, although in tone and manners they are altogether obsolete.

The serious or ideal French opera dates from the time of Louis XIV. Cardinal Mazarin, himself an Italian, had introduced into France the taste for the Italian opera. Louis too was desirous of rivalling or surpassing foreign nations in the external magnificence of the drama—in decoration, machinery, music, and dancing; these were to be used on festival occasions at court, and accordingly Molière was employed to write gay operas, and Quinault grave ones, for the music of Lulli. As Quinault is the only great poetical name in the history of the higher French opera, we refer to his article [QUINAULT] for what we have further to say of that particular species. The *operette*, or comic opera, has been much more successfully cultivated by modern French writers, owing, in a great degree, to the substitution, in this kind, of ordinary dialogue in lieu of recitative, so unfavourable to dramatic animation. The *vaudeville*, in which the lighter dramatic writers of France have of late been so wonderfully prolific, and which so peculiarly harmonizes with the tone of good-natured gaiety in the more popular classes of that country, is but a variety of the comic opera; its essential distinction being, that it dispenses with musical composition, as the songs are set to well-known popular airs.

It is a fact worthy of attention, that the histrionic art, especially in tragedy and the higher comedy, has long been carried in France to very high perfection. Schlegel himself admits, that in external dignity, quickness, correctness of memory, and in a wonderful degree of propriety and elegance in the delivery of verse, the best French actors can hardly be surpassed.

On the whole, we must observe, there is no cause to apprehend any permanent decay of dramatic art in France. The most powerful and most salutary external stimulus that the artist can receive, more especially the dramatist, is not the merely material and pecuniary support of the public for whom he labours, but an enlightened interest and sympathy on the part of that public for his art itself; and the French people, with a livelier general susceptibility of this nature than some of their neighbours, have ever been peculiarly alive to the attractions of the stage. When, therefore, we consider the important advances which the liberated mind of France has already made in philosophy, in poetry, and especially in history; when, also, we consider that the French theatre has not been operated on by circumstances like those which in England, as we shall see, have so long created purely physical yet insurmountable obstacles to vigorous dramatic cultivation; we may fairly conclude, that the modern stage of France is destined to reach far higher and more varied excellence than even its noblest geniuses could attain under the despotic restrictions of the old dramatic system. Nor can we help remarking, that in the mean time the English critic is bound to show indulgence rather than severity to the very errors and extravagancies of a rising school which so cordially and so explicitly sets up Shakspeare, if not as the god of its idolatry, yet certainly as the object of its highest, most admiring, and most affectionate reverence, as well as its most zealous emulation.

GERMAN DRAMA.

The earliest mention of the performance of Mysteries in Germany appears in the 'Eulen-spiegel,' which professes to be the history of a celebrated buffoon of that name, who is stated to have lived about the middle of the fourteenth century, although the book itself is not older than the beginning of the fifteenth. We there find, amongst other elegant matters, 'How Eulen-spiegel made a play in the Easter fair, wherein the priest and his maid-servant fought with the boors.' The oldest extant German drama was written about the middle of the fifteenth century, by one Hans Rosenpluet, a native of Nuremberg. He was succeeded by two fertile writers born in the same imperial city, Hans Sachs and Ayrer. Among the works of Hans Sachs we find a great number of tragedies, comedies, spiritual and temporal histories, where the prologue and epilogue are always spoken by the herald, besides merry carnival plays. All these pieces, it appears, were acted, not by players, but by respectable citizens, as an allowable relaxation, without any theatrical apparatus. The carnival plays are rather coarse, but often extremely droll, running indeed into the wildest farce, and overleaping all the bounds of reality. 'The composition,' says Schlegel, 'is respectable, and does not contain many circumlocutions: all the characters, from God the Father downwards, state at once in plain terms what they have at heart, and why they make their appearance; like those figures in old pictures, who have labels put in their mouths to assist the defective expression of the attitudes.' Allegorical personages frequently appear; and the form approaches most on the whole to what were elsewhere called Moralities.

In the first half of the seventeenth century, Opiz, regarded as the founder of the modern forms of German poetry, translated several tragedies from the antients into verse, and composed operatic pastorals after the Italian manner; but it is not known whether he wrote anything expressly for the stage. Next came Andreas Gryphius, considered as the first dramatic writer of Germany. Among his imitations and translations from various modern languages, are, a tragedy from the Flemish of Vondel, and a farce called 'Peter Squonz' (Peter Quince), which is an extension of the burlesque tragedy of Pyramus and Thisbe in Shakspeare's 'Midsummer Night's Dream.' The latter was then almost unknown beyond his own island: the learned Morhof, who wrote in the last half of the seventeenth century, confesses that he had never seen Shakspeare's works, though he was well acquainted with Ben Jonson. Even so late as the middle of last century, a German writer of some merit could institute a comparison between Gryphius and Shakspeare; though assuredly no further resemblance is traceable than this, that Gryphius, as well as Shakspeare, was fond of calling up the spirits of the departed. He seems rather to have had before his eyes the Flemish writer Vondel, whom his countrymen still call the great Vondel, while Gryphius himself has been consigned to oblivion. The plays of Gryphius are written after the French model in Alexandrines; the scene sometimes changes; and the interludes, partly musical, partly allegorical, somewhat resemble the old English masks; the author however shows little theatrical skill; nor is it even known that his pieces were actually performed. The tragedies of Lohenstein, who wrote at the same time, are of such immeasurable length as clearly to have set all representation at defiance.

'The pitiful condition of the theatre in Germany at the end of the seventeenth and during the first third part of the eighteenth century,' says Schlegel, 'wherever there was any other stage than that of puppet-shows and mountebanks, exactly corresponded to that of the other parts of our literature. We have a standard for this wretchedness when we consider that Gottsched could pass for the restorer of our literature—Gottsched, whose writings resemble a watery beverage, such as was then usually recommended to patients in a state of convalescence, from a notion that they could bear nothing stronger, by which means their stomachs become still more enfeebled. Gottsched, among his other labours, composed a great deal for the theatre Connected with a certain Madame Neuber, who was at the head of a company of players in Leipzig, he discarded Punch (*Hanswurst*), and they buried him solemnly with great triumph. I am willing to believe that the parts of Punch, of which we may even yet form a judgment from puppet-shows, were not always ingeniously filled up extemporarily; still Punch had undoubtedly more sense in his little finger than Gottsched had in his whole body. Punch, as an allegorical personage, is immortal; and however strong the belief of his burial may be, he still pops unexpectedly upon us, in some grave office-bearer or other, almost every day.

'Gottsched and his school now inundated the German theatre, which was thenceforward to be regular by dint of insipid and diffuse translations from the French. Heads of a better description began to labour for the stage; but instead of producing really original works, they brought forth only wretched imitations; and the reputation of the French theatre was so great, that the most contemptible mannerism was as eagerly caught hold of as the fruits of a better taste. Thus, for instance, Gellert still composed pastoral plays after bad French models, wherein shepherds and shepherdesses, with rose-red and apple-green ribands, uttered all manner of insipid compliments to one another. Besides the French comedies, those translated from the Danish of Holberg were acted with great applause. This writer certainly has great merit. His pictures of manners possess great local truth; his exhibitions of depravity, folly, and stupidity, rest on an extremely good foundation; in strength of comic motives and situations he is not deficient; he is only not very inventive in his plots; the execution runs too much out into breadth. The Danes highly relish the delicacy of his jokes in their own language, but the vulgarity of his tone is revolting to our present taste; yet in the low sphere in which he moves, and in which there are incessant storms of cudgellings, it may be natural enough. Attempts have lately been made to revive him, but seldom with much success. As his chief merit consists in his characterization, which is certainly somewhat caricatured, he requires good comic actors to appear to any advantage. A few of the plays of that time, in the manners of our country, by Gellert and Elias Schlegel, are not without merit; only they have this error, that into their pictures of folly and stupidity the same wearisomeness has crept which accompanies them in real life. In tragedies, properly so called, after French models, the first who were in any degree successful were Elias Schlegel and afterwards Kronegk and Weisse. I know not whether their labours, if translated into good French verse, would appear as frigid to us as they do in German. It is insufferable to us to read verses of an ell long, in which the style seldom rises above watery prose; truly poetical expression was first created in Germany at a subsequent period. The Alexandrine, which in no language can be a good metre, is doubly stiff and heavy in ours.' Thus, bad translations of French plays, with pieces from Holberg, and afterwards from Goldoni, and with some feeble German imitations devoid of any peculiar spirit, may be said to have constituted the repertory of the German stage, until Lessing appeared to commence the work of redeeming it from its long-continued mediocrity.

The sceptical and analytic spirit of Lessing was, however, more successful in reforming the theory than improving the practice of the German drama. His first original play, 'Miss Sara Sampson,' is a familiar tragedy of the lacrymose kind, in which he seems to have had before him as a model 'The London Merchant' of Lillo, better known in England under the name of 'George Barnwell.' But in 1767, his connexion with a company of comedians at Hamburg, and a periodical paper devoted to theatrical criticism which he conducted, gave him occasion to enter more deeply into the consideration of dramatic art. The boldness and acuteness with which, through this medium, he attacked the prevalent French taste in tragedy were so successful that in a short time not only the translations of French tragedies, but the German tragedies modelled after them, disappeared from the stage. He was the first who spoke warmly of Shakspeare, and paved the way for his appearance in Germany. But his faith in Aristotle, and the influence which Diderot's writings had exercised over him, produced a singular mixture in his theory of the drama. Unacquainted with the rights and the necessary conditions of poetical imitation, he desired to have in dialogue everything else a naked copy of nature. His attack on the Alexandrine measure was just; but the best critics of his country regret that he succeeded so far in his efforts to abolish all versification: hereby, say they, he opened greater facilities to that insipid affectation of nature in which so many of their later dramatic writers have indulged.

Owing to these prosaic views of art, Lessing, in the few dramatic works which he produced with great labour, and in which he proceeded for the most part on the classical principle of separating the comic and the tragic species, was much more effective in the former kind than in the latter. 'Minna von Barnhelm,' although it owed much of its extraordinary success to the allusions which it contains to the memorable circumstances of the seven years' war, is a genuine comedy of the more refined description, the whole social tone of which is peculiarly German, while the comic secondary characters are drawn with great humour. But in 'Emilia Galotti,' which exhibits the story of Virginia transferred, by change of names and places, to modern Italy, the author has introduced the cool and prying observation of the comic writer into the province of tragedy, and the passions are acutely characterised rather than eloquently expressed. 'It is singular enough,' remarks Schlegel, 'that of all the dramatic works of Lessing, the last, "Nathan the Wise" (Nathan der Weise), which he wrote merely with a view,' as he says, 'to laugh at the theologians, when his zeal for the improvement of the German theatre had pretty much cooled, should yet be the most conformable to the genuine principles of art. A remarkable tale of Boccaccio is wrought up with a number of inventions which are wonderful, yet not improbable, when we consider the circumstances of the times; the fictitious persons are grouped round a celebrated historical character, the great Saladin, who is drawn with historic truth; the crusades in the back-ground, the scene at Jerusalem, the meeting of persons of various nations and religions on this oriental soil,—all this gives to the work a romantic air; while the thoughts, foreign to the age in question, which the poet has allowed himself to intersperse for the sake of his philosophical views, form a contrast somewhat hazardous indeed, but yet exceedingly attractive. The form is more free and comprehensive than in the other pieces of Lessing; it is nearly that of a drama of Shakspeare.' Here, too, the author returns to the use of versification; not, indeed, to the Alexandrine, but to the unrhymed Iambic, answering to the English blank verse. 'That Lessing,' adds Schlegel, 'although possessing so independent a mind, still allowed himself in his dramatic practice to be in some measure overcome by the general inclination of his age, I infer from this, that the number of imitations of "Nathan" were very few in comparison with those of "Emilia Galotti."

As the leading object of Goethe seems to have been to give his genius the fullest possible expression in his works, so he was indifferent as to the form, though generally preferring the dramatic. He was at the same time a warm friend to the theatre, and sometimes laboured to comply with its wants as determined by custom and the taste of the day; as, for instance, in 'Clavigo,' where he produced a familiar tragedy in the manner of Lessing, and in 'Stella,' where he took nearly the same liberty with the old German story of Count Von Gleichen as Lessing did with that of Virginia. 'At an after period,' says Schlegel, 'he endeavoured to effect a reconciliation between his views of art and the common dramatic forms, even the subordinate, nearly all of which he ran through with single attempts. In his "Iphigenia" he expressed the spirit of the ancient tragedy according to his conceptions of it, especially its repose, perspicuity, and ideality. With the same simplicity, flexibility, and noble elegance, he composed his "Tasso," in which he applied an historical anecdote to mark the general signification of the contrast between a court life and a poetical one. His "Egmont," again, is a romantic and historic drama, the style of which steers a middle course between his first manner in "Götz von Berlichingen" and the form of Shakspeare. "Erwin und Elmire," and "Claudine von Villabella," may be called ideal operettes, breathed out so lightly and airily, that, with musical accompaniment and representation, they do but run the risk of becoming heavy and prosaic: in these pieces the noble and sustained style of the dialogue of his "Tasso" is varied by the tender songs. "Jery und Bätely" is a charming natural picture of Swiss manners, in the spirit and form of the best French operettes; while "Scherz List und Rache" is a true opera *buffa*, full of Italian *lazzi*. "Die Mitschuldigen" is a rhymed comedy, in the manner of common life, according to French rules. "The Triumph of Sentimentality" (Der Triumph der Empfindsamkeit") is a highly ingenious satire of Goethe's own imitators, inclining to the arbitrary and the fancifully symbolical of Aristophanes, but a modest Aristophanes in good company and at court. At a much earlier period Goethe had, in some of his merry tales and carnival plays, completely appropriated to himself the manner of our honest Hans Sachs.' Of the '*Faust*,' which must be regarded as Goethe's peculiar creation, though forming so grand and remarkable a feature in the poetical literature of modern Europe, there is little to be said in immediate relation to the drama. It is well observed by Schlegel, that to exhibit that boundless and labyrinthian production on the stage, we should be possessed of Faustus's own magic staff and his formulæ of conjuration. Yet much is to be learned from it both as to plan and execution. In a prologue the poet declares why he could not accommodate himself to the demands of a mixed multitude of spectators, and so writes, as it were, a farewell epistle to the theatre.

Meanwhile, shortly after the first appearance of Goethe, a very vigorous effort had been made to bring Shakspeare upon the German stage; and Schlegel is of opinion that, in some of his most celebrated characters, tragic and comic, Schröder perhaps attained the same perfection which had been almost idolized in Garrick. The plays however had the disadvantage of appearing in cumbersome prose translations, and often in mere abstracts, with disfiguring alterations: the separate characters and situations had been to a certain degree hit, but by no means the sense of his composition.

Under these circumstances appeared Schiller, endowed with the qualities requisite for producing a strong effect on the multitude as well as on minds of higher cultivation. Though his genius was daring in the highest degree, yet in the works of his youth he was influenced by the models of Lessing, by the earlier productions of Goethe, and by Shakspeare, so far as he could understand him without an acquaintance with the original. 'The Robbers' ('Die Räuber'), wild and horrible as it is, had, as is well known, so powerful an effect as absolutely to turn the heads of some youthful enthusiasts. Notwithstanding the signal success of this and his other first attempts, Schiller became sensible of the discipline which his genius required, and threw himself, with all the natural vehemence of his character, into the task of self-cultivation. The first result was his 'Don Carlos,' wherein, with great depth of characterization and great pathetic power, the plot is so intricately complicated, and the characters philosophize so much, as to swell the work to a size incompatible with due theatrical representation. After the course of sound historical and philosophical study by which the poet next enriched his mind and enlightened his views of art, he applied himself wholly to historical tragedy, and endeavoured, by divesting himself of his individuality, to rise to purely *objective* exhibitions. In 'Wallenstein' he strove to adhere so conscientiously to historical truth, that his materials, though embracing no great historical extent, swelled out into two plays and a rather didactic prologue: in the forms he closely followed Shakspeare, but endeavoured to confine the changes of place and time within narrower limits, and to maintain what he conceived to be a more sustained tragical dignity. 'Marie Stuart' is executed with more perfect artistical skill. In 'The Maid of Orleans' the plot is looser and less faithful to history; but its dazzling effect and rich ornaments of language gained it distinguished and deserved success upon the stage. 'The Bride of Messina' is an attempt, apparently neither judicious nor successful, to produce a tragedy romantic in substance, but antique in form. The last of Schiller's productions, 'Wilhelm Tell,' is considered by Schlegel as his best. 'Here he has wholly returned to the poetry of history: the manner in which he has handled his subject is true, and cordial, and, when we consider Schiller's ignorance of Swiss nature and manners, wonderful in point of local truth. It is true he had here a noble source to draw from, in the speaking pictures of the immortal John Müller. Within view of Tell's chapel, on the banks of the lake of Lucerne, in the open air, with the Alps for a background, this picture of heart-elevating old German manners, piety, and true heroism, might have merited performance as a solemnization of Swiss freedom five centuries after its foundation. How much farther Schiller might have carried the advancement of the German drama it is difficult to estimate, as he now devoted himself exclusively to the theatre, attained with every fresh work a higher mastery in his art, and was carried off by an untimely death in the full maturity of his mind.

The appearance of great original minds in Germany has always been followed by crowds of imitators. Thus an early production of Goethe's, '*Götz von Berlichingen*,' wherein he exhibits, in a bold and vivid way, the manners of the latter part of the middle ages, produced a whole inundation of *chivalrous plays*, in which, says Schlegel, 'there was nothing historical but the names and other historical circumstances; nothing chivalrous but the helmets, bucklers, and swords, nor anything of old German honesty but the supposed rudeness: the sentiments were as modern as they were vulgar: from chivalry pieces they became real *cavalry* pieces, which certainly deserve to be acted by horses rather than by men.' The next place in the public favour has been held by the *family picture*, and the *affecting* or *sentimental drama*, two secondary species which Lessing, Goethe, and Schiller themselves cannot be acquitted of having encouraged, the former by precept, the two latter by the example of their earliest compositions. In these kinds (in the latter of which Kotzebue was so prolific, and for a while so popular), the essence of dramatic poetry being mistaken, a pretended moral aim is laid down; the morality appearing however in the one class of pieces under the confined shape of economy, in the other under that of sensibility; and the dramatic fruits have been correspondent to the unsoundness of such principles.

'The poetical as well as moral decline of the taste of the time,' observes Schlegel, in conclusion, 'has been attended by this consequence, that the writers who are the greatest favourites on the stage seek only for a momentary applause, regardless of the opinion of good judges and of true esteem: those, however, who, with higher aims, have both these objects before them, cannot prevail upon themselves to comply with the demands of the multitude, and when they do compass dramatically are wholly regardless of the stage: hence they remain deficient in the theatrical portion of the art, which can be attained in perfection only by practice and experience. The repository of our stage exhibits therefore in its miserable wealth a motley assemblage of chivalrous pieces, family pictures, and sentimental dramas, occasionally, though seldom, varied by works in a grander and more cultivated style, of Shakspeare and Schiller. In this state of things, translations and imitations of foreign novelties, especially of the French afterpieces and operettas, are indispensable. Owing to the worthlessness of the individual works, the fleeting charm of novelty is alone sought for in theatrical entertainment, to the great injury of the histrionic art, as a great number of insignificant parts must be got by rote in the most hurried manner, to be immediately forgotten.'

English Drama.

The period in which we find the earliest traces of the general introduction of dramatic exhibitions by the clergy throughout the spiritual empire of Rome, being that in which, under the regime of the Norman conquest, the old French language and literature had full predominance in England, and a very large proportion of its clergy were of Gallic extraction, French was necessarily the original language of our religious drama; and the first pieces that it possessed were either borrowed directly from continental writers, or were composed by the Anglo-Norman clerks in the Gallic idiom. None of the dramatic manuscripts in that language, which must have been used in England for two or three centuries after the conquest, have descended to us; but in addition to the most sufficient historical evidence of the fact, some of the miracle plays that remain in English contain the plainest internal evidence of their having been closely translated from a French original. It was not until the 36th of Edward III. that the pleadings in any of the courts of law were allowed to be made in English. At the commencement of Edward's reign (as observed by Tyrwhitt in the essay on the language and versification of Chaucer, prefixed to his excellent edition of the 'Canterbury Tales') the French and English languages subsisted together throughout the kingdom; the higher orders, both clergy and laity, speaking almost universally French; while the lower retained the use of their native tongue, but also frequently added to it some knowledge of the other. Ralph Higden himself, the reputed author of the Chester miracle-plays as they now appear in English, bears a remarkable testimony (in his *Polychronicon*, B. I., c. lix.) to the manner in which the English language was impaired by the children in general being still obliged at school to construe their lessons, &c. in French, by the children of the gentry being taught to speak French from their cradle, and by the anxiety of the commoners to talk French that they might be the more highly thought of.

We find religious dramas to have been regularly established performances in London as early as 1180. William Fitzstephen, in the introduction to his Life of his friend and patron, archbishop Becket, written between 1170 and 1182, tells us that London, in lieu of the theatrical spectacles and stage plays of the Romans, to which he has just before alluded, had then a holier description of plays, in the representations of the miracles worked by holy confessors, or of the sufferings wherein the martyrs had displayed their constancy.[*] However, from Mathew Paris (*Vitæ Abbatum*) and from Bulæus (*Historia Universitatis Parisiensis*) we learn that the miracle-play of 'St. Katherine' had been exhibited at Dunstable before the year 1119. According to the latter authority this play of 'St. Katherine' was not then by any means a novelty; and from a passage in the 'Annales Burtonenses,' or 'Annals of Burton Abbey,' we may infer that in the middle of the 13th century itinerant actors were well known in England.

The oldest extant specimen of a miracle-play in English is among the Harleian MSS. in the British Museum: it probably formed one of a series, and is certainly as ancient as the earlier part of the reign of Edward III.; it is founded on the 16th chapter of the apocryphal gospel of 'Nicodemus,' and relates to the descent of Christ into hell, to liberate from thence Adam, Eve, John the Baptist, and the prophets. Besides this and a few other single pieces, and a set of three plays founded on that part of the 'Acts of the Apostles' which relates to the conversion of St. Paul, there exist in this country three series of miracle-plays which go through the principal incidents of the Old and New Testaments. These are:—1. The Towneley collection, supposed to have belonged to Widkirk Abbey, the MS. of which appears to have been written about the reign of Henry VI. 2. A volume called the 'Ludus Coventriæ,' consisting of plays said to have been represented at Coventry at the festival of Corpus Christi, the MS. of which is at least as old as the reign of Henry VII. 3. The Chester Whitsun plays, of which there are two MSS. in the British Museum, one dated in 1600, the other in 1607. Several specimens of Cornish miracle-plays are extant, which differ from the English in no material characteristic but that of language.

The best idea that we can give of the groundwork of these plays is by specifying the subjects of that one of the series above mentioned which is the most numerous. This is, the Coventry series, comprising 42 plays, viz.:—1. 'The Creation.' 2. 'The Fall of Man.' 3. 'The Death of Abel.' 4. 'Noah's Flood.' 5. 'Abraham's Sacrifice.' 6. 'Moses and the Two Tables.' 7. 'The Genealogy of Christ.' 8. 'Anna's Pregnancy.' 9. 'Mary in the Temple.' 10. 'Mary's Betrothment.' 11. 'The Salutation and Conception.' 12. 'Joseph's Return.' 13. 'The Visit to Elizabeth.' 14. 'The Trial of Joseph and Mary.' 15. 'The Birth of Christ.' 16. 'The Shepherds' Offering.' 17. (Wanting in the MS.) 18. 'Adoration of the Magi.' 19. 'The Purification.' 20. 'Slaughter of the Innocents.' 21. 'Christ disputing in the Temple.' 22. 'The Baptism of Christ.' 23. 'The Temptation.' 24. 'The Woman taken in Adultery.' 25. 'Lazarus.' 26. 'Council of the Jews.' 27. 'Mary Magdalen.' 28. 'Christ Betrayed.' 29. 'Herod.' 30. 'The Trial of Christ.' 31. 'Pilate's Wife's Dream.' 32. 'The Crucifixion.' 33. 'Christ's Descent into Hell.' 34. 'Sealing of the Tomb.' 35. 'The Resurrection.' 36. 'The Three Marys.' 37. 'Christ appearing to Mary Magdalen.' 38. 'The Pilgrim of Emaus.' 39. 'The Ascension.' 40. 'Descent of the Holy Ghost.' 41. 'The Assumption of the Virgin.' 42. 'Doomsday.'

There is abundant evidence that the Romish ecclesiastics, in their first introduction of this kind of representations, especially that part of them relating to the birth, passion, and resurrection of Christ, had the perfectly serious intention of strengthening the faith of the multitude in the fundamental doctrines of their church; and it seems the less extraordinary that they should have resorted to this expedient, when we reflect that before the invention of printing, books had no existence for the people at large. But it is no less certain that the repetition of these exhibitions rapidly worked upon the popular mind an effect which, it is likely, the priestly dramatists themselves had not contemplated in the first instance: it developed the universally latent passion in the breast of social man for spectacle in general, and for dramatic spectacle especially, *for its own sake*. Here, again, was the strongest encouragement of all for the clergy to persevere in their dramatic efforts. Finding the lively pleasure which the people took in this mode of receiving religious instruction, they were attempted to add, according to their barbarous ability, embellishment after embellishment to the simple copies which they had originally presented of the most remarkable passages of Scripture story, until the profane exhibition itself, 'the miracle *play*,' and not the sacred subject of it, became the sole object of interest to the people who composed the audience at these representations, as, also, it certainly became the primary object of the greater part of the ecclesiastics who took part in getting them up. These two facts are shewn with the utmost clearness by the collective testimony of all the contemporary writers who have thrown a general light upon the manners of the later middle ages.

These considerations will sufficiently account for one remarkable contrast, amongst others, which the early drama of modern Europe presents to the early Greek drama, though both flowed directly from a religious source; that while in the latter a groundwork drawn from human history was adorned and elevated by mythological intermixtures; in the middle-age drama, on the contrary, the basis or substratum was religious, but soon became so much overlaid with allusions to actual life, and with sketches of manners, and even of character, drawn from the actual society, as to leave scarcely a trace of that solemnity which must in the beginning have been intended to characterize the performance. The proclamation of the Chester plays, which was read over in various parts of the city on St. George's day, before the commencement of the performances, expressly excuses the introduction of 'some things not warranted by any writ,' on the ground that it was done 'to make sport' and to 'glad the hearers.'

The dialogue in these productions was, for the most part, extremely rude and inartificial; and as to plot, they cannot properly be said to have had any. It is not until the middle of the sixteenth century that we arrive at a scriptural play having anything approaching to a regularly constructed dramatic action. In this respect the series of plays which we have been considering should rather be described as a series of shows or pageants exhibited in succession, but without any artificial connection. Each of these detached divisions of the representation was indeed commonly called a 'pageant;' and each succeeding play or pageant of the series was supported by a new set of performers. Thus, to get up one of these extensive sets of plays, it was necessary to provide and to prepare a large number of actors; and here we see one manifest reason why this longer class of performances was almost wholly confined, in England as well as on the continent, to the larger cities.

The seasons for exhibiting the grand scriptural plays were chiefly the Christmas and the Whitsun holidays. The getting up and acting of these in the great cities early devolved upon the trading companies, each guild undertaking a portion of the performance and sustaining a share of the expense. The authentic information regarding the exhibition of the Corpus Christi plays at Coventry extends from the year 1416 to 1591, during the whole of which period there is no indication that the clergy in any way co-operated. The Chester records likewise establish that the whole management of these representations there was in the hands of laymen. From Stow's Chronicle we learn that in London this class of performances was undertaken by the parish clerks (who were incorporated in Henry III.) as early as 1409; and it is remarkable that no instance is to be found of the trading companies of London having been, at any date, so engaged. The pieces were acted on temporary erections of timber called scaffolds or stages; and it appears that in some instances they were placed upon wheels, in order that they might be removed from one part to another of a large town, and so the plays might be repeated successively in various quarters. Some of the Chester pieces required the employment of two, and even of three scaffolds, besides other contrivances: the street also must have been used, so several of the characters enter and go out on horseback. The same remark is applicable both to the Widkirk and the Coventry plays. In the latter indeed 'the place' and 'the mid place' are mentioned as the scene of part of the action; and it is evident from some of the stage directions, that two, three, and even four scaffolds, were erected round a centre, the performers proceeding, as occasion required, from one stage to another across 'the mid place.' It may be observed, too, that in one of the Widkirk plays Cain is exhibited at plough with a team of horses; and that in another it is absolutely necessary that something like the interior of a cottage should be represented, with a peasant's wife in bed, who pretends to have been just delivered of a child, which lies beside her in a cradle.

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[*] The reader may like to see this very remarkable passage as it stands in the original text; the words are these: 'Lundonia pro spectaculis theatralibus, pro ludis scenicis, ludos habet sanctiores, representationes miraculorum quæ sancti confessores operati sunt, seu representationes passionum quibus claruit constantia martyrum.'

These exhibitions however of long successions of Scripture pageants form a kind of exception to the general footing of the drama in those ages. The dramas which still most generally prevailed were those which proceeded originally from two distinct though kindred sources, which may be thus described. The first was the desire to impress the minds of the people in a vivid manner with those fundamental points of Scripture history which the greater festivals of the Christian church were established to celebrate, by exhibiting before them, especially during the seasons of Christmas and Easter, a living representation of the subject of celebration at that particular time. The second was the desire to strengthen and maintain the people's devotion to the patron saint of the church of their particular locality, by exhibiting on his feast-day a lively representation of his most remarkable actions or sufferings. To these two classes of performances the ecclesiastical establishments, not only of the cathedrals and monasteries, but of a great many parochial churches, were quite equal; and accordingly they continued to be generally prevalent in England until the commencement of the Reformation, and did not entirely cease until its complete establishment. From first to last, the clergy were not only the authors of the pieces exhibited within the churches, but were also, without any liability to ecclesiastical censure, the actors in or managers of the representations. But they did not long confine the exercise of their histrionic powers either to the consecrated subjects or within the consecrated walls. They soon partook of the dramatic passion which they had indirectly awakened, and came to like both plays and playing for their own sake. In Burnet's History of the Reformation we find that, so late as 1542, bishop Bonner had occasion to issue a proclamation to the clergy of his diocese, prohibiting 'all manner of common plays, games, or interludes, to be played, set forth, or declared, within their churches and chapels.' And from the following passage of a tract printed in 1572 it appears that even then interludes were occasionally played in churches: the author is deploring how the clergy neglect their duties: 'He againe posteth it (the service) over as fast as he can gallop; for either he hath two places to serve, or else there are some games to be played in the afternoon, as lying for the whetstone, heathenishe dauncing for the ring, a beare or a bull to be bayted, or else jack-an-apes to ride on horseback, or an enterlude to be played; and if no place else can be gotten, it must be doone in the church.' In proof also, that in the early part of the same century ecclesiastics still exhibited themselves as common players, we see, among many other evidences, that in 1519 Cardinal Wolsey found it necessary to insert an express injunction against this practice in the regulations of the Canons Regular of St. Austin.*

Miracle plays were acted very constantly at Chester until 1577, at Coventry until 1591, at York until late in the sixteenth century, at Newcastle until 1598, at Lancaster, Preston, and last of all at Kendal, in the beginning of the reign of James I. Although, in the beginning, these plays only dramatised certain scriptural events by the characters historically concerned, yet abstract impersonations found their way into them by degrees. This was perhaps done to introduce some variety into the constant repetition of the same sets of *dramatis personae*. Among the first innovations of this kind were the representatives of Truth, Justice, Peace, and Mercy, in the 'Parliament of Heaven,' which forms part of the eleventh play or pageant of the *Ludus Coventriae*. Death, in the same series, was a subsequent addition; and the Mother of Death, a still later enrichment; until at length such characters as 'Rancor' and 'Envy' were employed, having more of individuality, but still personifying the passions supposed to have actuated the Jews against Christ. As such characters became more numerous, they interfered in a certain degree with the progress of the action; in some pieces the scriptural characters fell quite into the back ground; and thus in course of time, what seems to have been at first designed as a sort of poetical embellishment to an historical drama became a new species of drama unconnected with history. This was called a 'moral' or 'moral-play,' the object being to enforce and illustrate some ethical precept; for it must be observed, that the term 'morality,' as applied to a dramatic production, is, like 'mystery,' of comparatively recent introduction into our language. Some manuscript productions of this class have been lately discovered, which show that moral-plays were in a state of considerable advancement early in the reign of Henry VI. They seem to have reached their highest perfection under Henry VII., although they afterwards exhibited a greater degree of ingenious complication. In the reigns of Henry VII. and VIII., a company of actors usually consisted of only four or five individuals; but by doubling some of the parts, they were able to perform the greater number of the dramatic entertainments then in fashion.

Besides allegorical personages, there are two standing characters very prominent in moral-plays, the Devil and the Vice. The Devil was no doubt introduced into moral-plays from the old miracle-plays, where he had figured so amusingly that his presence was indispensable in the new species of drama; and accordingly we find him acting as leader of the Seven Deadly Sins in one of the most ancient moral-plays that have been preserved. He was made as hideous as possible by the mask and dress which he wore; and from various sources we learn that his exterior was shaggy and hairy, so that in one piece he is mistaken by one of the characters for 'a dancing bear.' His 'bottle nose' and 'evil face' are repeatedly mentioned; and that he was not without a tail is evident from the circumstance that in one place the Vice asks him for a piece of it to make a fly flap. His ordinary exclamation on entering was 'Ho, ho, ho!' and on all occasions he was given to roaring and crying out, especially when, for the amusement of the audience, he was provoked to it by castigation at the hands of the Vice, by whom he was generally, though not invariably, accompanied. As for the Vice himself, his name appears to have been derived from the predominant nature of his character, as amidst all his varieties of form, he is constantly represented as most wicked in design. As the Devil now and then appeared without the Vice, so the Vice appeared sometimes without the Devil. Malone tells us, that 'the principal employment of the Vice was to belabour the Devil;' but, though frequently so engaged, he had also higher functions. He was never introduced into the miracle-plays until after the reign of Mary; but in 'The Life and Repentance of Mary Magdalen,' which appeared in 1567, we find him performing the part of her lover, before her conversion, under the name of Infidelity; in which character he assumes various disguises, and successfully recommends to her 'not to make two hells instead of one,' but to live merrily in this world, since she is sure to be damned in the next. In 'King Darius,' dated 1565, he likewise acted a prominent part, under the name of Iniquity, by his own mischievous impulses, without any prompting from the representative of the principle of evil. Such was the general style of the Vice; and as Iniquity we find him spoken of by Shakspeare and Ben Jonson. Sometimes, however, the Vice and Iniquity seem to have been two distinct personages; and the former was not unfrequently called by the name of some particular vice. In the moral-plays, as in the miracle-plays before them, the comic ingredients were made to predominate more and more over the serious; and the Vice became a standing vehicle of grosser and more thorough buffoonery than the Devil himself. Thus it was that he came to be so completely confounded with the character of the domestic fool, as to be very commonly dressed in the fool's parti-coloured habit, wearing his dagger of lath. It appears to have been a very common termination of the adventures of the Vice for him to be carried off to hell on the Devil's back. In 'King Darius,' he runs thither of his own accord, to escape from Constancy, Equity, and Charity. It seems, also, that he was in the habit of riding and beating the Devil at other times than when he was thus forcibly carried off to punishment.

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* This curious MS. is in the British Museum, Cotton MS. Vesp. F. 8. It is printed in Wilkins's Concilia, iii. 687.

The mechanical contrivances used for the representation of moral-plays differed in no material point from those employed in the religious exhibitions which they gradually superseded; except that, in general, there seems to have been only one scaffold or stage, which was erected either in a street or on a green adjoining a town or village, sometimes in the public hall of a city or borough, and sometimes in a great private mansion.

One of the most curious of the later moral-plays was written in defence of dramatic exhibitions in general, in answer to a tract against them by Stephen Gosson, called 'The School of Abuse,' and published in 1579. This piece, entitled 'The Play of Plays,' was acted at a theatre in Shoreditch about 1580. A considerable portion remains of a still more remarkable production of this class, which must here be noticed as being the only one that we can trace as having had an object openly and entirely political: it seems to have been designed to illustrate and enforce the right rules of government for the good of a nation at large, and there is reason to suppose that it was suppressed immediately after its first performance. The portion preserved, about one-third of the whole, is in the Duke of Devonshire's collection, and consists of twelve closely-printed quarto pages, apparently of the date of 1566. From this fragment we gather that among the characters of the play were the following:—Albion, personified as a knight; Justice; Injury, who seems to have been the Vice of the piece; Division, and his two ministers Double-Device and Old-Debate; Temporalty and Spiritualty; Principality and Commonalty; Sovereignty, Peace, and Plenty. In the commencement of it, Injury, under the assumed name of Manhood, ingratiates himself with Justice and Albion, and endeavours to persuade the latter, amongst other things, that salutary acts of parliament are not enforced as they ought to be, but allowed to sleep, because they touch the lords spiritual and temporal, so that, although passed to benefit merchants and the commonalty, the great declare them only 'fit to wipe a pan.' In like manner, Division sends his agents to sow dissension, on the one hand, between the lords spiritual and the lords temporal, on the other between Principality (personifying the sovereign authority) and the Commons. But, although there is every appearance that the author made his play terminate in the defeat of the scheme of Injury and Division, and the happy union of Albion and Plenty, yet it is manifest that the Vice of the play was here made use of to cover some serious strokes of satire and reprobation against the political abuses of the time, involving the most important principles of constitutional government, and rendering this unique and mutilated piece a very interesting feature of our old dramatic literature, and an illustration of the various uses to which the stage was turned while no periodical press yet existed.

The moral-plays now extant are classed by Mr. Payne Collier (*Annals of the Stage*, &c.) in the following divisions:—1. The curious manuscript specimens formerly in the collection of Dr. Cox Macro, and now in that of Hudson Gurney, Esq., which are much more antient than any others yet discovered. 2. Printed moral-plays, the lesson enforced by which relates to the vices and regeneration of mankind at large. 3. Such as convey instructions for human conduct of a more varied character. 4. Pieces belonging to the class of moral-plays, but making approaches to the representation of real life and manners.

The performance of moral-plays was not wholly discontinued until the end of Elizabeth's reign; and one of the last dramatic representations that she witnessed was a piece of this kind, 'The Contention between Liberality and Prodigality,' played before her in the 43rd year of her reign. Attempts had however been very early made to invest even symbolical representatives with metaphysical as well as physical peculiarities, and attract for them a personal interest; and thus it was that even in the allegorical species, the nature of which would seem to have least admitted of such modification, advances more and more decided were successively made towards individuality of character, and consequently towards the representation of actual life. Hence nearly all the later moral-plays exhibit a strange mixture of individual characters with allegorical impersonations, which, however, with all its violent incongruity, was a necessary step in the progress towards the modern drama, the drama of human passions and manners.

The first English dramatic productions in which it was attempted to exhibit sketches from actual life without any scriptural, saintly, or allegorical intermixture, belong to that class to which the denomination of *interludes*, though it has had a more general application, most properly and distinctively belongs. These pieces being, as their name imports, expressly designed for performance during the intervals of convivial entertainment, the first condition of their structure was that the limits should be brief and the characters few. The historical play of 'Sir Thomas More,' written towards the close of the reign of Elizabeth, and extant among the Harleian MSS., shows very exactly the time, form, and manner of such representations. Sir Thomas More there gives a splendid supper to the lord mayor of London, the aldermen, their wives, &c.; and four men players and a boy (the latter taking, no doubt, the female parts) having heard of the intended banquet, tender their services in order to vary the amusements. Sir Thomas declares that it 'will be excellent to have a play before the banquet,' and asks the actors what pieces they can perform. In answer, they run over the titles of six different pieces, out of which Sir Thomas chooses the one entitled 'The Marriage of Wit and Wisdom.' Its representation accordingly commences, as a play within a play, and is continued until there occurs an accidental interruption. The piece selected by Sir Thomas More on this occasion was evidently of the class of 'morals,' and so do all the pieces acted by way of interlude appear to have been until the reign of Henry VIII.; so much was this the case, that the very terms 'moral' and 'interlude' came to be generally confounded. John Heywood, a musician of Henry's household, set the first example of composing interludes quite independently of allegorical materials.

Among the pieces of Heywood's that have come down to us, the three which alone can strictly be termed *comic* are directed against the vices of the clergy, and more especially of the holy mendicants who swarmed over the land under the names of friars and pardoners. They have much of the genuine humour as well as broad satire of Chaucer's comic pictures wherein the same characters so prominently figure; and indeed it should here be borne in mind that, in the same spirit which favoured the production of these satirical interludes, Henry, when his thoughts had begun to tend towards ecclesiastical reform, patronized the first printed edition of 'The Canterbury Tales.' In the earliest of the pieces in question, 'A mery play betwene the pardoner and the frere, the curate and neybour Pratte,' Leo X., whose remarkable indulgence to similar compositions we have already had occasion to mention, is spoken of as still living. A pardoner and a friar have each obtained leave of the curate to use his church; the former to exhibit his relics (among which he shows 'the great toe of the Holy Trinity'), the latter to deliver a sermon, their common object being the raising of money. The friar arrives first, and is about to commence his discourse, when the pardoner comes in and disturbs him; each desires to be heard; and after many vain attempts by force of lungs, they proceed to beat and cuff each other unmercifully. The curate, called by the disturbance in his church, endeavours, without avail to part the combatants; he therefore calls in neighbour Pratt to his aid; and while the curate seizes the friar, Pratt undertakes to deal with the pardoner, in order that they may set them in the stocks. Both friar and pardoner, however, prove too strong for their assailants, and the latter, after receiving a sound drubbing, are glad to allow the former quietly to depart. In the course of the piece, the friar, pardoner, and curate deal out the most furious curses, and neighbour Pratt is the only decently-spoken man of the party. In 'The Four P's' (that is, the Palmer, the Pardoner, the Poticary, and the Pedlar), the question at issue among them is, which shall tell the greatest lie. And in the 'mery play between Johan the husbande, Tyb his wife, and syr Johan the preest,' the nature of the plot will easily be divined, especially by such as are acquainted with Chaucer's comic tales. Heywood's play of 'The Weather' was written to illustrate a point of natural philosophy, and to vindicate Providence in its distribution of the seasons. Perhaps, too, he should be regarded as the inventor of another species of composition, dramatic in so far as that it was conducted in dialogue and recited in public, but without plot, being merely a discussion in verse, between two or more characters, of some particular topic or opinion. This sort of production being little calculated for popularity, it is not surprising that but one specimen of it by him has descended to us, and that in manuscript. The point bated in this colloquy, which would occupy about three quarters of an hour in the delivery, is whether a fool or a wise man be the happier; and though the conclusion eventually come to is in favour of the latter, it is remarkable that Will Somer, the fool of Henry VIII., is often mentioned in the course of the dialogue as illustrating the advantage of being without understanding and education.

The only extant English interlude from real life in which the tragic element predominates, was designed, as its title tells us, to show 'as well the beauty and good properties of women, as their vices and evil conditions;' contrasting the character of the heroine Melibea with that of Celestina, a sort of compound of procuress and sorceress, who is hired by Melibea's lover to corrupt her, in which, after using extreme art, she succeeds; and the piece ends with exhibiting the bitter grief and repentance of the heroine. It is founded on the famous Spanish 'Celestina,' which we have already described as a long dramatic dialogue rather than a drama; but though the English piece has some vigour, it altogether wants those subtle graces which gave so wide a popularity to its foreign prototype.

It must here be observed, that in the literature of the later middle ages the term 'tragedy' was used to denote any serious narrative in verse. In his treatise *Della Volgare Eloquenza*, Dante speaks of it as denoting elevation of style ('per tragediam superiorem stilum induimus'); and he modestly names his own great poem *commedia*, while, in its 21st canto, he terms Virgil's Æneid, in his admiration, *una tragedia*. Bojardo, at a later date, calls his romantic poem a 'comedy,' comparing it with Homer's 'tragedy,' the Iliad. To the like effect is Chaucer's definition of tragedy in 'The Monke's Tale;' and consistently with it Lydgate calls his 'Fall of Princes' a series of 'tragedies.' Churchyard wrote several elegies which he terms tragedies; and Markham, so late as 1595, published 'the tragedy of Sir Richard Greenville,' an heroic poem in octave stanzas. Bishop Bale was the first to apply the denominations 'tragedy' and 'comedy' to dramatic productions in English: he calls 'God's Promises,' one of his own printed religious plays, a tragedy; and a series of plays from the life of Christ, one of which, 'The Temptation,' is also extant in print, he terms comedies. None of these however differs in any essential respect from the previous miracle-plays: they were all printed abroad in 1538; and it is to be remarked of them that they contain the first extant attempts to promote the Reformation by means of the stage. Besides religious plays of the beginning of Elizabeth's reign connected in subject and acted in succession, several dramas were written and printed at the same period upon separate stories and incidents in the Bible, complete in themselves, and apparently performed without reference to any other pieces that might precede or follow them. One of the most remarkable of these is 'The Life and Repentance of Mary Magdalene,' already mentioned, printed in 1567, and apparently written after the Reformation was completed.

'A newe, mery, and wittie comedie or enterlude, treating upon the historie of Jacob and Esau' (apparently written about 1557, but not printed till 1568), though its subject is scriptural, makes nearer advances to the structure and general character of a modern play than any piece that preceded it. In addition to the scriptural characters, it has, of the author's invention, Ragau, servant to Esau; Mido, a boy who leads blind Isaac; Hanan and Zethar, two of Isaac's neighbours; Abra, a girl who assists Rebecca; and Debora, an old nurse. Here indeed we have a five-act play, with a plot regularly constructed, characters discriminated and contrasted, and a versification, for that period, vigorous and flowing, while the comic portions of the piece have humour independent of coarseness.

The general tenor of the last-mentioned play is tragic, or at least decidedly serious. In the earliest piece of equal dimensions and regularity of structure that can properly be termed a comedy we have also the first avowed dramatic imitation, in English, of the antients. This is 'Ralph Roister Doister,' which was certainly in being as early as 1551, and probably written as early as the reign of Henry VIII. The former existence of such a piece had long been known, when in 1818 a printed copy was discovered, of which a limited reprint has been made. The author was Nicholas Udall, who died after 1564, having been master, first of Eton and afterwards of Westminster School. Warton (*Hist. Eng. Poet.* iii., 213) quotes from the antient Consuetudinary of Eton School a passage importing that yearly, about St. Andrew's day, November 30, the master was accustomed to select, according to his own discretion, such Latin plays as were best and fittest to be acted by the boys in the following Christmas holidays, with scenic decorations, before a public audience; and that sometimes also he ordered the performance of plays in English, provided that he found any with sufficient grace and wit. The author of the piece in question calls it, in his prologue of four seven-line stanzas, a 'comedie or enterlude,' the latter, as we have already intimated, being at that date the ordinary appellation for a dramatic production in general; so that, in employing also the less usual term 'comedy,' Udall seems to claim to have his play regarded as of more *regular* and *classical* construction, making at the same time express reference to the works of Plautus and Terence, as precedents which he had endeavoured to imitate. The scene of this comedy is laid in London; and it is in a great degree a representation of the manners and notions of the middle classes of the metropolis at that period. It is divided into acts and scenes, has nine male and four female characters, and the performance must have occupied two hours and a half, while few of the moral-plays would require more than an hour, for of those which were in two parts each part was exhibited on a separate day. The plot is amusing and well constructed, with an agreeable intermixture of serious and humorous dialogue, and a variety of character to which no other English play of a similar date can make any pretension. Another comedy, of the like dimensions and general structure, has lately been discovered in manuscript. It is entitled 'Misogonus;' and the author was apparently one Thomas Rychardes. The scene is laid in Italy, and the piece was probably founded on some Italian tale or play; it represents however the manners of England, and has many allusions to the circumstances of the day; although the plot is simple, there is much variety of situation and character; and it is worthy of remark that, under the name of *Cacurgus*, the qualities and functions of that important personage, the domestic fool, are more distinctly as well as amusingly exhibited than in almost any other of our old plays. This piece is ascertained to have been composed about 1560. It is certain that the former of these two comedies, and extremely probable that the latter, preceded the production of 'Gammer Gurton's Needle,' which all our literary and dramatic antiquaries before Mr. Collier have spoken of as the earliest English comedy, though, when it was acted at Christ's College, Cambridge, in 1566, its author, Still, afterwards bishop of Bath and Wells, was only in his twenty-third year. In merit it is far inferior to the pieces just mentioned; 'the writer,' as Warton observes, 'has a degree of jocularity which sometimes rises above buffoonery, but is often disgraced by lowness of incident.' The dialogue too is for the most part in the broadest provincial dialect, not in any respect exhibiting a specimen of the ordinary language of the time. This however appears to be the first existing English play that was acted at either university; and it is a singular coincidence that its author should have been the very same person who, many years after, when become vice-chancellor of Cambridge, was called upon to remonstrate with Queen Elizabeth's ministers against the having an English play performed before her at that university, as unbefitting its learning, dignity, and character.

The earliest extant piece in English that can now with any propriety be termed a tragedy, was written by Thomas Sackville (afterwards Lord Buckhurst and Earl of Dorset) and Thomas Norton, a barrister; and was acted before the queen at Whitehall, on the 18th of January, 1561. In the first and third printed editions it is called 'The Tragedy of Gorboduc,' from the name of a supposed antient British king; but in the second it is entitled, more correctly, 'The Tragedy of Ferrex and Porrex,' from those of his two sons, who contend for sole possession of his kingdom after he has divided it between them. A dumb show precedes each of the five acts, prefiguring what is to occur;[*] the first four acts are closed by choruses in rhyme, and the fifth by a didactic speech of nearly two hundred lines. Sir Philip Sidney, who, in his 'Apology of Poetry' (written about 1583) maintains the fitness of observing the antique unities, though complaining that those of time and place are neglected in 'Ferrex and Porrex,' admits that it is 'full of stately speeches and well-sounding phrases, climbing to the height of Seneca his stile, and full of notable morality, which it doth most delightfully teach.' It is not indeed surprising that this first attempt to imitate or emulate the regular or classic tragedy should have been highly extolled at the time, especially by those who inculcated by formal precept a general imitation of the antique models; but certain it is, that, both as to incident and dialogue, the piece is laboriously heavy; the speeches are of most tedious length, and the thoughts and sentiments very trite and commonplace. It is however worthy of especial notice, that this was the first play in the English language the dialogue of which was written in blank verse. This, again, in all probability was owing to the earnest endeavour which the authors were making to follow the method of the antients. This tragedy was followed almost immediately by 'Julius Cæsar,' the earliest instance on record in which events from the Roman history were dramatised in English, although the precise nature of this performance, of which we have nothing but the mention in an old MS. chronicle, cannot be ascertained. It is doubtful, however, whether both these pieces were not preceded by a tragedy founded on Luigi da Porto's famous tale of 'Romeo and Juliet.' From about this date until shortly after 1570, the dramatic field seems to have been pretty equally divided between the later moral-plays and the earlier attempts in tragedy, comedy, and history. In some pieces of this date and a little later, as already shown, endeavours were made to reconcile or combine the two kinds of composition; but afterwards the morals generally gave way to the more popular and intelligible species of performance. We find precedence given to the latter in the license to James Burbage and others in 1574, in its mention of 'comedies, tragedies, interludes, and stage-plays;' and in the act of common council of the following year against theatrical performances in the city they are designated as 'interludes, tragedies, comedies, and shows.'

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[*] It should be remarked that in our oldest tragedies these dumb shows were not always typical of the ensuing incidents: they sometimes served to introduce supplementarily such circumstances as could not be conveniently included in the actual performance, and sometimes they supplied deficiencies, or covered the want of business on the scene.

Still the terms tragedy and comedy, in general acceptation, remained far from the strictness of signification attached to them by the professed inculcators, by example or precept, of the imitation of the antients. It is observable, however, that comedy was from the beginning used in a more comprehensive sense than tragedy, being in fact very often employed as synonymous with the general designation of play. It is plain, even from the instances we have already cited, that, for a long period, any play might without impropriety be termed a comedy, though none but a serious piece was ever called a tragedy. Hence it was, that, as late as 1578, Thomas Lupton called his moral-play of 'All for Money' both a comedy and a tragedy; and hence it is, that Shakspeare makes Hamlet, after he has had the tragedy exhibited before the king and queen, exclaim,

'For if the king like not the comedy,' &c.

Not only, however, was the tragic element, as we here see, by no means excluded from what was at that time understood as comedy; but the comic, as we find, both from examining the productions of the time, and from the testimony of the contemporary critics, was employed without reserve in tragedy. Thus Sir Philip Sidney, the most distinguished at that day among the English champions of the classic school, in his 'Apology of Poetry,' written, as already mentioned, about 1583, after inveighing severely against the total disregard, by the English dramatists, of the unities of time and place, felt himself called upon to add:—'But besides these gross absurdities, how all their plays be neither right tragedies nor right comedies, mingling kings and clowns, not because the matter so carrieth it, but thrust in the clown by head and shoulders, to play a part in majestical matters with neither decency nor discretion; so as neither the admiration and commiseration, nor right sportfulness, is by their mongrel tragi-comedy obtained.'

Small as is the value now-a-days of this critical opinion of Sidney's, it affords an interesting and conclusive testimony as to the essentially romantic character of the rising drama, which we thus find it to have thoroughly, and, as the classic advocates deemed, incorrigibly, assumed at least ten years before Shakspeare, who by some has been supposed to have impressed that character upon it, became an original writer for the stage. The vast variety of matters embraced by the dramatists of that day, and of sources from which they drew, is perfectly expressed in the prologue to the 'Royal King and Loyal Subject,' one of the earlier productions of Thomas Heywood, who became a writer for the stage some years before the death of Elizabeth.

Sidney says nothing of the performance of miracle-plays in his time; but we know from many other authorities, that while the romantic drama was thus establishing itself, and moral-plays were still frequently exhibited, pieces founded on Scripture history continued to be represented. The latter, however, already confined chiefly to country places, soon ceased altogether; nor have we any specimen of what can strictly be termed a moral-play subsequent to the death of Elizabeth.

We have now traced the progress of the English stage from its ecclesiastical and religious origin until it became almost exclusively a mirror of actual life, and attained all those dramatic and theatrical forms which most prominently characterized the later and fuller maturity of our elder modern drama. It was in the same year, 1583, wherein Sidney wrote his 'Apology,' that Elizabeth first allowed a public company to act under her name and authority. As the dramatic writers who flourished in the brief interval between this period and that of the fullest development of Shakspeare's genius, with one exception, did nothing importantly to alter or improve dramatic art, it is needless to enlarge upon the various kinds and degrees of merit which made a number of them, as Kyd, Lodge, Greene, Lyly, Peele, Nash, Chettle, Munday, Wilson, &c., highly popular and celebrated in their own time. Immediate predecessors of Shakspeare, they have long been lost, necessarily and deservedly, 'in the near effulgence of his blaze.' The single exception that we are called upon to make is in favour of Christopher Marlow, of whom we must observe, not only that his works exhibit greater vigour both of conception and of language than belongs to any of his contemporaries, but also that he was the first who established the use of blank verse upon the *public* stage, in lieu of that exclusive rhyming which possessed it before he wrote.

The collection of Shakspeare's plays, as commonly printed, affords the grandest and most instructive study possible of the progress of the romantic drama from the crudeness of its early state to the blended richness of its full maturity. In this view, even those pieces in that collection in the composition of which Shakspeare is known to have had little or no concern, become extremely interesting. Such plays as the 'First Part of Henry VI.,' 'Pericles of Tyre,' and 'Titus Andronicus,' for instance, if not highly favourable, are not unfair specimens of the state of the stage when Shakspeare was first introduced to its acquaintance; the 'Second' and 'Third Part of Henry VI.,' 'King John,' &c., show us in progressive gradation the rapid development of his wonderful power of infusing a spirit of life into a production which came into his hands a piece of cold, heavy, mechanical, and often incongruous composition. In the 'Two Gentlemen of Verona,' &c. we have the first of the spontaneous flowings from his own peculiar and delightful spring of dramatic poesy, 'unmixed with baser matter;' and then, proceeding onward, still rising as we proceed, we pass through those greater historical compositions, whether from English or Roman history, which display so deep an insight into national as well as individual character, and into the personal springs of political transactions; and through those pieces founded on romantic story, as 'Romeo and Juliet,' 'Othello,' &c., fraught with all the depth, wildness, and the richness of vehement passion; until we reach the grandest and most profound of his dramatic creations, where, in boundless diversity, the beauties and deformities, the glory and the emptiness, of human existence are unfolded in the tender light of a compassionate sympathy, as in 'The Tempest,' or disclosed with more awful depth and unsparing though beautiful rigour in 'Macbeth,' in 'Lear,' in 'Timon of Athens,' or in 'Hamlet.'

Indeed, as the compositions of Shakspeare form the most elevated region of dramatic poetry in that age, so the play of 'Hamlet' may, we think, be taken as the highest summit of that region. It seems to present the finest example of the depth, sublimity, refinement, and variety of which the romantic drama is capable; and it is the most abundantly marked with those peculiar characteristics which sprang from the union, in the person of its author, of such wonderful dramatic powers with such familiar and thorough experience of theatrical management. Thus, besides its exalted interest in a poetical view, it is singularly valuable as an historical study of dramatic and histrionic art. Here Shakspeare exhibits to us even the relation in which the lord chamberlain stood to the players; and from the pedantic enumeration which Polonius's loquacity gives us of the various kinds of pieces which the actors whom Hamlet engages could perform, we gather what was then the established mode of classifying dramatic productions. 'The best actors in the world,' says Polonius, 'either for tragedy, comedy, history, pastoral, pastoral-comical, historical-pastoral, tragical-historical, tragical-comical, scene individable, or poem unlimited.' The latter part of this nomenclature, indeed, seems chiefly the offspring of the chamberlain's own pedantic and talkative affectation; it is to the three leading distinctions of tragedy, comedy, and history, that we should principally attend.

Of Shakspeare's younger contemporaries and competitors who have transmitted a living memorial of their works to posterity, the principal are Ben Jonson, Beaumont and Fletcher, and Massinger. Jonson demands our more particular notice as the chief advocate and practiser, among the old English dramatists, of the imitation of the ancients: as standing indeed almost alone among them in that respect, and so earning Milton's well-known characterization in 'L'Allegro' of 'Jonson's learned sock.' Totally different as Jonson was from Shakspeare, both in his views of dramatic art and in his poetical constitution, he yet found a ready encourager in the latter, who was so far superior to all petty jealousy and rivalry. It was by Shakspeare's intervention that Jonson's first piece was brought upon the stage; a second even received touches from his hand; and in both he undertook the performance of a principal character. We have two tragical attempts of Jonson, and a number of comedies and masks. He could have risen to the dignity of the tragic tone, but had no turn for the pathetic. It is curious to observe how much, while he was constantly preaching up the imitation of the ancients, his two tragedies differ both in substance and form from the antique models: we see here the irresistible influence which the prevailing taste of an age and the course already pursued in an art must exercise upon even the most independent minds. In the historical extent given by Jonson to his 'Sejanus' and his 'Catiline,' unity of time and place were altogether out of the question; and both pieces are crowded with a number of secondary personages. In 'Catiline,' indeed, the prologue is spoken by the spirit of Sylla, and much resembles that of Tantalus in the 'Atreus and Thyestes' of Seneca; while to the end of each act a moralizing chorus is appended, but not duly introduced or connected with the whole. This is all the resemblance to the ancients; in other respects the form of Shakspeare's historical dramas is adhered to; but without their romantic charm. 'Catiline' and 'Sejanus' are in fact solid dramatic studies after Sallust and Cicero, and after Tacitus, Suetonius, Juvenal, &c.; but their author had not learned from Shakspeare the art of remaining true to history and yet satisfying the demands of poetry. Jonson was a strong advocate for *the purity of the species*, that is, for the alleged classical circumscription of tragedy and comedy; yet he had little talent for comedy in the antique spirit, and accordingly the later Roman satirists were his models rather than the comic writers. Fancy was less powerful in him than the spirit of observation, and hence in plot and incident he is often defective. He possessed a methodical head, and accordingly, when he had conceived a character in its leading idea, he followed out that idea with a strictness which excluded whatever might merely serve to give individual animation. He generally seized with accuracy the manners of his own age and country; but he attached himself so much to external peculiarities, then called humours, that a great part of his comic delineations soon became obsolete: his Captain Bobadil, however, in 'Every Man in his Humour,' forms an exception to this remark; and though less original and entertaining than Falstaff's companion Pistol, he is nevertheless a model in his way, and has been imitated by subsequent writers. In the masks of that day there seems to have been something congenial to the learned and rather frigid spirit of Jonson, and he was almost distinguished in their composition than any other writer of the period: these were allegorical occasional pieces, usually designed for court festivals, decorated with machinery, masked dresses, dancing, and singing. This secondary dramatic species nearly expired with Jonson: the only subsequent production in this way of any celebrity is the 'Comus' of Milton.

It is no mean honour to Beaumont and Fletcher, that after Shakspeare, who stands alone in all dramatic history, they are entitled to the highest place among the romantic dramatists of England. They seem indeed to have had almost every dramatic quality short of that marvellously unerring instinct which Shakspeare possessed, and which appears to be vouchsafed to few. They began their career in Shakspeare's lifetime; Beaumont indeed died before him, and Fletcher survived him only nine or ten years. They followed his example in the whole form of their plays, regardless of the different principles of Ben Jonson and the imitation of the ancients. Like him, they drew from tales and romances; they mingled burlesque with pathetic scenes, and endeavoured, by the concatenation of the incidents, to give an impression of the extraordinary and the wonderful. Shakspeare's own fame was in some degree eclipsed by them in the generation which immediately succeeded him; and in the time of Charles the Second they possessed a still greater proportion of popularity. 'Beaumont and Fletcher,' remarks Schlegel, 'were in fact men of the most distinguished talents: they hardly wanted any thing but a more profound seriousness of mind, and that sagacity in art which observes a due measure in every thing, to deserve a place beside the greatest dramatic poets of all nations. They possessed an uncommon fecundity and flexibility, and a felicitous ease, which however too often degenerated into levity. Poetry with them was not an inward devotion of the feelings and imagination, but a means to obtain brilliant results. Their first object was *effect*, which the great artist can hardly fail of attaining if he is determined above all things to satisfy *himself*. They were not players, like most of their predecessors, but they lived in the neighbourhood of the theatre, were in constant intercourse with it, and so had a perfect understanding of theatrical matters. They were also thoroughly acquainted with their contemporaries; but they found it more convenient to lower themselves to the public than to follow in this particular the example of Shakspeare, who elevated the public to himself. They are least successful in their tragic attempts, because their feeling is not sufficiently drawn from the depths of human nature, and because they bestowed too little attention on the general consideration of human destinies; they succeed much better in comedy, and in those serious and pathetic pictures which occupy a middle place between comedy and tragedy. The morality of these writers is ambiguous. Not that they failed to contrast in strong colours magnanimity and goodness with baseness and wickedness, or did not usually conclude with the disgrace and punishment of the latter; but they often exhibit an ostentatious generosity in lieu of duty and justice. Every thing good and excellent arises in their pictures more from transient ebullition than from fixed principle; they seem to place the virtues in the blood; and impulses of a merely selfish and instinct-like nature hold up their heads quite close to them as if they were of kindred origin. There is an incurably vulgar side of human nature which the poet should never approach but with a certain bashfulness when he cannot avoid letting it be perceived; but instead of this, Beaumont and Fletcher throw no veil whatever over nature; they express every thing bluntly in words; they make the spectator the unwilling confidant of all that more noble minds endeavour even to hide from themselves. The indecencies in which these poets allowed themselves to indulge exceed all conception; the licentiousness of the language is the least evil; many scenes, nay, even whole plots, are so contrived, that the very idea of them, not to mention the sight, is a gross insult to modesty. Their pieces had this convenience for performance in their time, that such great actors were not necessary to fill the principal characters as in Shakspeare's plays. To bring them on the stage in our days, it would be necessary to recast the greater part of them: with some of them we might succeed by omitting, moderating, and purifying various passages.'*

Massinger, Shirley, Ford, and such other of the younger contemporaries of Shakspeare as we have not yet mentioned, have no characteristics sufficiently distinctive to admit of their being particularized in this general survey. There was then a grand school of dramatic art in England, of which Shakspeare was the root, though not frequently unacknowledged, head; for Ben Jonson had scarcely a successor. One effect of mannerism in art is, to efface the marks of individual originality, and make the productions of various artists resemble each other; and from this mannerism no dramatic poet of that age who succeeded Shakspeare is altogether free. Nevertheless, in a general view of dramatic art, this first period of the English theatre is far the most important: it can hardly be doubted that some even of the secondary writers of that time are more instructive for theory and more remarkable in practice than the most celebrated of all the succeeding times.

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* This assertion has been verified in a very recent instance by the successful production, at the Haymarket Theatre, of 'The Bridal,' a recasting of 'The Maid's Tragedy' of Beaumont and Fletcher. Their 'Rule a Wife and have a Wife' has kept the stage by similar means. It has also been brought upon the German stage, having been re-written by Schröder under the title of 'Stille Wasser sind tiefe' [illegible]

Such was the general condition of the stage during the reign of Charles I. down to the year 1642, when the invectives of the puritans, who had long murmured against the theatre, and at last thundered loudly against it, were changed into prohibitory law; and in 1648 not only to act plays, but even to witness them, was made a penal offence. Nearly all the players now took arms on that side the interests of which seemed identified with the existence of their own profession. Many of them perished in the field; and after the final close of the war, one company of actors only was formed out of the remains of all the former ones, and occasionally, with great circumspection, performed at private mansions in the vicinity of London.

Davenant as manager, and Betterton as actor, form a slender link of connection between the old stage and that of the Restoration. Charles II. being considered, in his relation to the theatre, as a sort of restoring and tutelar deity, its character was now formed in absolute deference to the half foreign and wholly vicious taste of himself and his courtiers. Under these auspices, Davenant introduced the Italian system of decoration, the *costume* as then understood, the opera music, and the use of the orchestra in general. A still more important innovation in theatrical arrangements was, the permanent adoption of the practice, against which the puritans had directed the most violent of their anti-dramatic fury, but which had long been established in Italy, Spain, and France, of having the female parts personated by women instead of boys. At the same time, Betterton was sent over to Paris expressly to take a view of the French stage, in order to such other modifications of the English as the inspection might suggest. The result of this great neglect of the old dramatic and theatrical system of England, and assiduous study of that of France, was, for a long period, an almost entire denationalization, both in form and spirit, of the current dramatic literature. Davenant himself, who had resided very much at Paris, seems to have acquired this exotic taste long before the Restoration, as it is fully exhibited, amongst others of his productions, in his operatic piece, 'The Siege of Rhodes,' performed as early as 1656. Hence, in the theatrical restoration which accompanied the political, he set himself cordially to work, by altering old pieces, and writing new plays, operas, prologues, &c., to contribute towards the furnishing of that new theatrical repertory which the new dramatic system required. Of all his works, however, nothing has escaped a merited oblivion.

It was left for the industry and fertility of Dryden to give the new theatre a thorough establishment according to the new ideas, a task to which he applied himself with all possible diligence both by example and precept. The numerous essays on dramatic art which accompanied the publication of his several pieces, together with the larger treatise which he put forth separately, exhibit in a remarkable manner the anarchy which then prevailed in the notions of that art which then pervaded the public mind. The court indeed, whose taste it was now the leading object of the dramatic writers to seize and to follow, had no real knowledge of the fine arts; it merely favoured them, like other foreign fashions and inventions of luxury. Hence the drama of the day became a strange compound of the extreme license of the later writers of the earlier English school with the conventional stiffness and formality of the French, but without any of the natural and vigorous spirit which had animated either of those models. Dryden's fatal facility of rhyming, as in this case it may well be termed, materially aided him in effecting this incongruous combination, to which the absence in him of the highest poetic spirit likewise essentially conduced. It may be observed of his plays in general, that the plots are grossly improbable, and the incidents thrown out at random, while the most marvellous theatrical strokes drop, as it were, incessantly from the clouds. Scarcely a spark of nature is to be found in any of his characters: passions, criminal and magnanimous, flow with indifferent levity from their lips without ever having dwelt in the heart: their chief delight seems to be in heroical boasting. The tone of expression is by turns flat and madly bombastic: the author's wit is displayed in far-fetched sophisms, and his imagination in long-spun similes awkwardly introduced. The Duke of Buckingham, who, amongst other vigorous though wayward and generally misapplied talents, possessed high powers of ridicule, undertook to satirize these faults and absurdities of Dryden and his school, in his comedy of 'The Rehearsal,' wherein, although the structure of the piece itself might have been more artificial and diversified, the separate parodies are very ingenious and effective.

But the best-aimed satire, though it might correct in some degree, could not regenerate the stage. This could have been done only by the arising of some greater and more genuine dramatic genius, or at least by the successful appearance of some very great actor, capable of entering fully into the spirit of the elder drama. 'The Rehearsal' might indeed contribute to produce that nearer approach to nature which, among the compositions of Dryden's younger contemporaries, has preserved upon the stage one tragedy of Lee's and two of Otway's, while not one of Dryden's pieces has maintained its theatrical existence; but the essential constitution of the acting drama remained as before. The mixed romantic species being entirely laid aside, all was either tragedy or comedy. Dryden wrote comedies as well as tragedies; but as, with all his command of language and flow of rhyme, he did not possess in any perfection either the greatest dramatic or the highest poetical qualities, his dramatic writings, in this kind as well as in the other, have fallen, if not into absolute oblivion, at least into entire neglect. Shadwell's seventeen comedies, though he affected to imitate Ben Jonson in exhibiting humours and eccentric peculiarities of character, are deservedly forgotten. Wycherley, so much in favour both with Buckingham and King Charles, and afterwards with King James, had much more genuine pretensions to the higher and more vigorous order of comic power, notwithstanding that his greatest performance, 'The Plain-dealer,' is a sort of counterpart of Molière's 'Misanthrope;' his next best piece, 'The Country Wife,' has been retained upon the stage, by means of adaptation and purification, under the title of 'The Country Girl.' Although the 'Sir Fopling Flutter' of Etherege is not yet forgotten, still Congreve deserves to be considered as the true father of 'genteel comedy' on the English stage, and was long regarded as the great model for imitation in that department, to which distinction he was much less entitled by any lively and humorous delineation of natural character than by a perpetual reciprocation of wit in his dialogue, together with originality of plot, and novel combinations of factitious manners: he drew little from common life; but his portraits of sharpers and coquettes—of men without principle and women without delicacy—are but too faithful representations of the fine gentlemen and ladies of his day. His 'Love for Love' is the only one of his pieces the licentiousness of which it has been found possible to prune sufficiently for performance in later years.

Of the poetic spirit and the moral tone of English comedy during the period we have just reviewed, we shall state our opinion in the words of Schlegel, because we think it useful to show to the English reader in what light that particular portion of our dramatic literature is justly received and represented by so able a continental critic:—'The great merit of the English comic poets of this period consists in the drawing of character; yet, though many of them have shown much talent in this way, I cannot ascribe to any of them a peculiar genius for character. Even in this department the older poets (not only Shakspeare, for that may well be supposed, but even Fletcher and Jonson) are superior to them. The moderns seldom possess the faculty of seizing the most hidden and involuntary emotions, and giving them comic expression; they generally draw merely the natural or assumed surface of men. The same circumstance that was attended with so prejudicial an effect in France after Molière's time came here also into play. The comic muse, instead of becoming familiar with the ways of living of the middle and lower ranks, her proper sphere, assumed an air of distinction; she squeezed herself into courts, and endeavoured to snatch a resemblance of the *beau monde*. It was now no longer an English nature, but a London comedy. The whole nearly turns on fashionable love-suits and fashionable raillery; the love affairs are either disgusting or insipid, and the raillery is always puerile and devoid of humour. These comic writers may have correctly hit the tone of their time: in this they did their duty; but they have reared a lamentable memorial of their age. In few periods has taste in the fine arts been at so low an ebb as towards the close of the seventeenth century and during the first half of the eighteenth. The political machine held its course; wars, negotiations, and changes of states, give to that age a certain historic splendour; but the cotemporary poets and the portrait painters have revealed to us the secret of its pitifulness: the latter in their copies of the dresses, the former in their imitations of the social tone. I am convinced that if we could listen to the conversation of the *beau monde* of that day in the present, we should find it as pitiful, affected and full of tasteless pretension as the hoops, the towering head-dresses, and high-heeled shoes of the women, and the huge perruques, cravats, wide sleeves, and ribbon knots of the men. The last, and not the least, defect of the English comedies is their indecency. I may sum up the whole in one word by saying, that after all that we know of the licentiousness of manners under Charles II., we still are lost in astonishment at the audacious ribaldry of Wycherley and Congreve. Not merely is decency most grossly violated in single speeches, and frequently in the whole plot; but in the character of the rake, the fashionable débauché, a moral scepticism is directly preached, and marriage is the constant subject of ridicule. Beaumont and Fletcher portrayed a vigorous though irregular nature; but nothing can be more repulsive than rude depravity coupled with claims to higher refinement.'

The continuance, and even increase, of this moral depravation of the drama produced at length, in 1698, a severe castigation from the pen of the sturdy nonjuror, Jeremy Collier, under the title of 'A short View of the Immorality and Profaneness of the English Stage, together with the Sense of Antiquity on this Argument.' In this work, its author, armed with sufficient learning and sarcastic wit, attacked all the living dramatists from Dryden to D'Urfey; and although some of them, including Congreve, less candid on this occasion than Dryden himself, set up a petulant and sophistical defence, yet this publication of Collier's had a permanent effect on the stage as well as on the public mind. This effect, however, was operated only by degrees. Vanbrugh followed in the line of Congreve, and, in spite of Collier's animadversions, did so with little more regard either to morality or decorum, though mingling more humour with his wit. This unbounded licence has long banished from the stage his ablest production, 'The Confederacy,' while 'The Provoked Wife' and 'The Provoked Husband,' inferior in comic power, have survived by virtue of their greater decency. His contemporary Farquhar, though displaying sufficient libertinism of language and sentiment, did not carry them to so gross an excess. A perfect gentlemanly ease of manner, lively spontaneity of wit, natural though not strongly drawn character, and a felicitous, uninvolved construction of plot, are his peculiar characteristics, and have preserved 'The Beaux' Stratagem' and two other of his pieces in public favour to the present time. His 'Sir Harry Wildair,' too, was the legitimate successor of the 'Sir Fopling Flutter' of the preceding generation; but in the true dramatic qualities Farquhar excels Etherege beyond all comparison. The Restoration period of English theatrical history had not only brought female performers for the first time before the public, but female dramatists also. The numerous comedies of Mrs. Behn, who wrote under Charles II., are remarkable only for the full share which they possess of the licentiousness of her time; nor need we remark upon two tragedies and a comedy, acted with some success, from the pen of Mrs. Manley, better known as a romantic memoir writer. But in Mrs. Centlivre, a prolific writer of comedy, exactly contemporary with Farquhar, we find more genuine dramatic talent, yet exhibited much more in a lively bustle of intrigue than in forcible delineation of character, although *Marplot*, in her 'Busy Body,' is still proverbial as a comic portrait, and some others of her plays, as 'The Wonder,' 'A Bold Stroke for a Wife,' &c., remain as well-known stock pieces. Just at the same period also Steele, among the other various exertions of his pen, wrote for the stage in a kindred spirit with Farquhar, but with inferior dramatic skill; and Cibber produced his best comedies, 'The Careless Husband' and 'The Nonjuror' (a sort of adaptation of the 'Tartuffe' of Molière), the very great success of which at that time was owing partly to its flattering the sentiments of the friends of the Hanoverian succession, and which, under an altered form and another title, 'The Hypocrite,' is still a favourite on the stage. Fielding, the novelist, commenced his literary career as a writer of comedy; he chiefly demands notice in dramatic history as one of the principal of those writers for the stage who afforded Sir Robert Walpole a *pretext* for obtaining the act to limit the number of theatres, and subject dramatic performances to the lord chamberlain's license. In a very similar predicament was Gay, after the appearance, in 1727, of his 'Beggars' Opera.' Its professed object was, by way of burlesque, to ridicule the Italian Opera, which had been established and maintained at great expense, and was thought by many to be rising in hurtful rivalry with the national drama. But amidst the general satire on political and fashionable selfishness and depravity which this composition implied, the persons then in power took so much of it to themselves, that while 'The Beggars' Opera' had the unprecedented run of sixty-three successive nights, and transformed the actress who represented the heroine into a duchess, the lord chamberlain refused to license for performance a second part of it entitled 'Polly.' This celebrated production, however, though still a standing favourite with the public, is now chiefly remarkable in dramatic history as the prototype (unwittingly, it seems, on its author's part) of a new species of dramatic composition upon the British stage, since known as 'the English opera.'

We must now revert for a moment to the history of modern English tragedy. After the example of Lee and Otway, Southern and Rowe endeavoured to return to a more natural tragic tone and style than those which Dryden had so long practised and inculcated. Southern even ventured to attempt the Shakspearian combination of the humorous and the ludicrous with the tragic, but was so deficient in that high mastery of the art which is necessary to accomplish this with success, that in his 'Oroonoko,' which, with another of his tragedies, under the altered title of 'Isabella, or the Fatal Marriage,' has kept the stage, the comic portions, being merely inserted or stuck on rather than interwoven or blended, have been simply dropped in performance, without being at all missed by the audience. Rowe was an honest admirer of Shakspeare, and in his 'Jane Shore' has even directly borrowed the part of Gloster from 'Richard the Third.' Without boldness and vigour, he possessed sweetness and feeling; he could excite the softer emotions; and hence, in his 'Fair Penitent' (a feeble remodelling, it must be observed, of Massinger's 'Fatal Dowry'), in 'Jane Shore,' and in 'Lady Jane Grey,' he has successfully chosen the weaknesses of heroines for his subject. Addison's 'Cato,' notwithstanding the great temporary celebrity and popularity which party rivalry conferred upon it, merits no attention in the history of dramatic art, except as having been the first, and, it should seem, the model, of a series of the most frigid productions in imitation of the French classic school, by Young, Johnson, Thomson, Glover, &c., that are to be found in our literary history. With some small poetic, they have no dramatic pretensions; yet the very excess of their formality and frigidity perhaps contributed to that decisive reaction of the public mind in favour of the older dramatic school, which took place in the middle of the last century, and which now demands our attention.

Garrick's restoration of Shakspeare to his rightful supremacy over the English theatre has entailed upon his countrymen a permanent debt of gratitude which is yet more glorious to the memory of that great performer than the idolatrous admiration of his contemporaries for his unrivalled histrionic powers. It was nothing less than the removal of one great mark, worn for eighty years before, of national degradation, morally and intellectually. Here, too, we have a signal instance of the great degree in which the dignity and prosperity of a national theatre at any given period may depend on the taste and genius of a single actor, especially when that actor becomes a leading manager also. In the instance in question this was more peculiarly and necessarily the case. When the condition of the English stage for three generations before is considered, it is quite evident that no person but an actor of very high genius could achieve the theatrical resuscitation of the greatest of all dramatic poets. Had any such actor existed at the restoration of Charles II., he might probably have done much to prevent the wretched denationalization of the theatre which was so much favoured by that king's exotic and vitiated taste. But it was one of the vital and lasting injuries inflicted on the theatrical system by the puritanical suppression, that the old line of actors which had risen and flourished along with the great and vigorous dramatic school of the age of Elizabeth and James, and had intimately imbibed its healthy natural tone, had 'grown with its growth, and strengthened with its strength,' was violently and fatally interrupted: a new race of actors had to arise, who, not having, like their predecessors of the former period, the example and the awe of the great histrionic models of the old school before them, found it a much easier task to strut and rant in the delivery of unnatural bombast than to sound the depths and reach the delicacies of nature's favourite poet. And thus an additional facility was opened for the introduction and perpetuation upon the stage of the factitious taste of Dryden and his followers.

It was left for one qualified to be the great actor of nature to lead forth the sublime poet of nature from his long theatrical obscurity. The clear, deep, quick, and varied truth which appeared in Garrick's interpretation of Shakspeare's leading characters, after all the cold, leaden, formal declamation under which even the best-esteemed performers had so long been accustomed to smother their spirit, was nothing less than a revelation to the play-going public of that day. The effect was electrical. Not only the leading dramatic taste, but the highest standard of acting, was raised at once to its antient elevation; nor has either of them, amidst all the minor vicissitudes of our theatrical history, ever since descended below it.

Of the genius and efforts of our dramatic writers during this latter æra it is not possible to speak so highly. It is perhaps too much to look once in a century, or even in several centuries, for a writer like Shakspeare, possessing such universal mastery over all human emotions as to be able to blend them in such endless variety as to move at will, in whatever order, in whatever alternation or juxtaposition that he pleases, our laughter and our tears. We know that there are myriads who can enjoy the tragic or the comic, more especially the latter, for one who can thoroughly relish both; and that yet smaller is the proportion among those who can relish both, of those who can excel in producing both. Yet it might not have been unreasonable to have expected among our later dramatic productions a greater number approaching the perfection of those models which other countries have produced within those narrower limits of tragedy and comedy which, as we have seen, were established as part of their dramatic system.

Garrick himself, having made no great attempt in dramatic composition, exposed himself to no considerable failure: one or two of his small afterpieces have kept possession of the stage; but his labour of this kind most worthy of mention is probably the share which he took in the composition of one of Colman's best comedies, 'The Clandestine Marriage.' Cumberland's comic powers were respectable; but in his most successful pieces, 'The West Indian,' brought out by Garrick in 1771, and 'The Wheel of Fortune,' to which John Kemble's masterly personation of the principal character gave so decided a popularity, he scarcely rises above mediocrity. Horace Walpole's tragedy, 'The Mysterious Mother,' though its subject necessarily excluded it from representation, set the first example of a vigorous attempt to return to a natural and healthy tragic tone and style. As for the 'Douglas' of Home, it has no such qualities to recommend it, but acquired and has retained the public favour chiefly by dint of one truly and deeply pathetic situation wherein the strongest domestic affections are profoundly and permanently interested. Sheridan gave new life and spirit to 'genteel comedy,' in which department he remains at the head of the writers of the present æra. Though perhaps his pieces are less perfectly finished than those of Congreve, already characterized as the chief of this class of dramatists in the preceding period, and although, especially in 'The School for Scandal,' he is subject to the same imputation as his predecessor, of being too indiscriminately lavish of epigrammatic wit, yet he has more truly comic wit, more force of genuine humour, than Congreve, as is more particularly felt in his play of 'The Rivals,' and should therefore, we conceive, be ranked above him as regards the more essential qualities of comedy. The dramatic merits of Goldsmith were of a totally different cast: a certain eccentric drollery of character and whims extravagance of plot are the distinctive characteristics of two comedies, one of which, though by no means am the most excellent productions of his pen, has kept an nourable place in the public favour. Of the elder Colm pieces, two, 'The Jealous Wife' and 'The Clandestine M riage,' are still deservedly esteemed; and the latter in p ticular is frequently acted: they combine much eleg of composition with considerable comic power. Nor am the comic dramatists of the latter half of the last cen must we forget to mention the once celebrated Sam Foote, who has been more commonly than appropria called the English Aristophanes, seeing that such a de nation conveys much too high a compliment to Foote, a very indifferent one to the great master of the elder G cian comedy. So little had Foote's pieces of that burle ideality which constituted the essential character of latter, that his exercise of the *vis comica* reduced it almost exclusively to a contemporary personal sa amounting to little more than a refined species of mim which, from the merest merceuary motives, he directed as readily against the most innocent peculiarities of in individuals as against the most injurious vices or f Hence it is, that of the many farces which he w chiefly to exhibit in them his own powers of satirical micry as an actor, not more than one survives upon stage.

It was towards the close of the century that the s mental comedy of the German school of Kotzebue, little but its novelty to recommend it, acquired a footi England. In this kind, among the direct adaptations fr the German, 'The Stranger' has had the most gen success, and is the most perfect representative of the s cies. Among the native efforts in the same line, Holcr 'Road to Ruin,' still popular, is one of the most meri The same writer has the credit also of having first in duced on the English stage the melo-drama, which since filled so large a place upon it. Mrs. Inchbald, a many pleasing original pieces in the lighter comedy, h likewise given us an adaptation from Kotzebue. M Lewis, in his tragedies, as in his romances, drew from a different German source, in his taste, we might almost his rage, for the marvellous and the terrific. A kindred s is displayed in the late Charles Maturin's tragedy of 'B tram,' to which Kean's acting gave high success. As re Lord Byron's tragedies, we have only to remind the r that as their author never designed them for repre tation, he is by no means chargeable with their dra failure.

We abstain from individual criticism of living En contemporaries. As regards modern efforts in the S spearian drama, the flight in this case is so lofty and s that even to attempt it may be said to require alm vigorous and as rare a genius as to succeed. But on ground next in elevation, that of tragedy in the limited sense, aspirants, if not very numerous, are yet time to time, presenting themselves: however, we h yet anything that approaches in natural vigour or in richness, either to the masterpieces of Schiller, or eve most successful efforts of the new romantic school of F In the higher comedy the experiments are yet m Decency has long been thoroughly established in th partment; but since Sheridan's time, we look in va for the raciness of humour, the brilliancy of wit, or th piness of invention which seasoned the licentiousne earlier comic writers. Of the occasional pieces wr show off the talent of particular actors, the numerou tations of French farces and vaudevilles, and the trifles that are continually coming forth into an e popularity in the form of comic opera or burletta, w merely remark that, with much that is lively and a they have little that indicates either vigour or orig of dramatic talent.

The late and continued decline of dramatic art land, which it is common to speak of as if it were t to the utter abasement of that art, if not to its ex tinction, seems to demand that we should point tinctly the leading considerations relative to this It is true that since the age of Elizabeth, for insta spread of printing and of reading, and above all, the progress of novel and romance writing since the m the last century, have reduced the theatre to the occ of a much smaller relative space among the sour public amusement. Novel and romance reading, in particular, has become its most immediate and powerful rival, as approaching nearest to it in the nature and vividness of the impulse afforded to the feelings and imagination, and as having the convenient capability of administering that excitement at all times and all places. Nevertheless, theatrical representations, besides those more general attractions which they may be said to share with some branches of reading, have their peculiar charms, for which no absolute equivalent is elsewhere to be found, and which therefore seem to place their perpetuity beyond all reasonable doubt. Besides that the perfect performance of a drama of the first order supplies the noblest enjoyment that art can offer to the mind through the medium of the senses, the pleasure which an audience derives from even an inferior dramatic production on the stage, is so much more vivid and immediate than reading can supply, as to free the former from all danger of being superseded by the latter. Nor are we inclined to lay much stress upon the favour extended by the more peculiarly aristocratic classes to the Italian opera, as a circumstance having any fatal or very injurious tendency as regards the national drama. The entire subordination in this foreign entertainment of every truly dramatic feature to musical effect (not to mention the unintelligibility of the language to most English ears), quite excludes it from the sphere of dramatic rivalry. Mere fashion apart, and as far as real pleasure is concerned, it is music and dancing, not acting, that people go expressly to enjoy at the Italian opera.

A much more evident, if not indeed an all-sufficient cause of the decline in question, is to be found in one remarkable result, which we must briefly state, of the monopoly of the higher dramatic performances possessed by the patentees of the two great winter theatres of the metropolis. The interpretation which for so long a period has been given to this privilege, of being not merely permissive but exclusive, led at length to an enormous enlargement of the houses, with a view to obviate complaint as to want of accommodation for the increased and increasing metropolitan population. Now, it is plain that nature in fixing the average powers of vision and of hearing, has appointed certain limits beyond which the most scientifically constructed theatre for the performance of the regular drama cannot be conveniently nor even safely extended; yet this most important consideration has been altogether overlooked or neglected in the instances before us; and the inevitable and merited consequence has followed, in the desertion of the great houses, and of those higher and more genuine dramatic performances which they at once monopolized and marred by their very magnitude. 'The falling off in the attendance of the public was gradual, though somewhat fluctuating. There was a large play-going audience that would not readily give up their amusements at the theatre—persons to whom this kind of entertainment had become almost a necessary of life, which they relinquished very slowly and with great reluctance, even when they could no longer see and hear as they wished to see and hear. Some did, however, give up their enjoyments; some died; some fell off from other causes, and their places were not supplied by others; many found new modes of being entertained; and thus the play-going audience was gradually reduced, and the theatres were abandoned and forsaken by a very large portion of those who, under other circumstances, would have supported them.'[18] Hence, at Covent-Garden Theatre, for example, during the twelve seasons from its rebuilding in 1809 to the year 1821, as appears from the accounts of the theatre, by the manager himself, the whole receipts of the house, including the performances of pantomimes, for which indeed its enormous magnitude was better adapted, were unequal to the current expenses of 'the legitimate drama' alone. Yet during that period the company was remarkably strong in excellent performers. Captain Forbes, in his evidence before the House of Commons' Committee on Dramatic Literature in 1832, named the principal ones thus: 'John Kemble, Charles Kemble, Cooke, Lewis, Incledon, Munden, Fawcett, Young, Jones, Blanchard, Emery, Liston; Mrs. Siddons, Mrs. Dickons, Mrs. C. Kemble, Mrs. H. Johnston, Mrs. Gibbs, and Mrs. Davenport.' Nor was this an expensive company made up for the new house; for all, or nearly all, of the performers thus enumerated had belonged to the old one. It should be further observed, that in this same period the income of the theatre declined, on an average of the last six seasons as compared with the first six, at the rate of nearly 21,000*l.* a year. The ten following seasons, however, when the theatre was held by Messrs. Kemble, Willett, and Forbes, present a much more deplorable account. Captain Forbes himself, in the evidence already quoted, states the loss at 20,000*l.* per annum. It also appears, from the statements of the interested parties themselves, that during the first twelve seasons the house was not, on an average, much more than half filled with spectators; and that during the last three of the seasons alluded to by Captain Forbes it was considerably less than half filled. The case of Drury-Lane theatre is so exactly parallel to that of Covent-Garden, as to require no separate illustration.

That the relish of the public for theatrical representations in general, if diminished at all, has not declined in a degree at all proportionate to the decay in the prosperity of the larger establishments, is manifest from one fact, of which the proprietors themselves complain—the extraordinary success of some of the minor theatres during the same period, which had risen, it would seem, in much the same proportion as the attendance at the great houses has fallen off,—showing, what indeed is plain enough without such demonstration, that people will more willingly attend even an inferior dramatic representation which they can see and hear perfectly, than a superior one which they cannot so hear and see.

The remedy for this preposterous state of things lies with the legislature, by opening a free theatrical competition which shall lead to the erection of houses for the regular drama, capable of holding little more than half the number of spectators necessary to fill houses so large as those of Covent-Garden and Drury Lane. A bill to permit the erection of other playhouses was, indeed, recently passed by the House of Commons, but was rejected by the Lords, owing in this case, we must suppose, to indolence or indifference in the hereditary House, rather than to hostility. This is, however, a question upon which the best interests of dramatic art, the care of the nation for its noblest scenic enjoyments, and a just regard for its character as to general cultivation in the eyes of the civilized world, should cause the public opinion to be expressed loudly, distinctly, and unceasingly, until the legislature does apply the remedy in its power.

Under these circumstances, the higher walks of dramatic composition could expect and have indeed received but little encouragement from the directors of the privileged theatres. Their first solicitude has necessarily been to fill the treasuries of their respective establishments; and this they have long been striving, though vainly, to effect by the production of all manner of dazzling and stunning spectacles, with performers two-footed and four-footed, which should at least possess, as they seem to have thought, the requisites of being *visible* and *audible*. But the few concluding suggestions which we proceed to make are offered in the firm conviction that the present injurious and degrading theatrical system 'as by law established' is too monstrous in itself and too insulting to the national taste and reason to be much longer maintained; so that any dramatist who is capable of deserving, may rely upon shortly obtaining, the most effective medium for communicating his creations to the minds of his countrymen.

One leading error, then, which still besets the practice of dramatic composition is directly derived from the grandest and most glorious event in the intellectual history of modern times, the revival of art and letters in the fifteenth and sixteenth centuries. We may well excuse many of the greatest minds of that period if, in the ardour with which they applied themselves to the wondrous and long-hidden stores of physical and intellectual beauty which had suddenly opened upon them, their first irresistible impulse was to emulate the external graces of the antique models by close and devoted imitation—if often they mistook the form for the essence, or at least confounded them together. But it is not easy to extend the like indulgence to the artist of the present age. Let him, indeed, study the ancients; but let him study them to the *bottom*. 'These time-battering' days demand that he should be able not only to raise his view above the maxims of Horace and Aristotle to that of the works from the consideration of which those maxims were formed—not only to see distinctly how antient criticism was merely a product of antient art—but also to perceive how that art itself had grown out of, and drew its vital energies from, the peculiar spirit of the artist's age and country. Thus it is that in order to give vitality to any modern imitation of the Grecian tragedy for instance, the Greek mythology itself must first be established in the belief of the auditory. Until the poet can first accomplish this, the noblest grace of conception, the highest beauty of language cannot render his work a living and breathing creation.

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[18] [illegible] Magazine of March, 1832.

The fundamental contrast between the religious principles of the antients and those of the moderns is found, on attentive examination, to be the leading source of the essential difference between the spirit of antient and that of modern art, especially of dramatic art. The more directly and exclusively any species of human composition is addressed to the feelings and imagination of a people, the more it must necessarily be influenced by the predominant character of that people's religious system, which, of all things whatever, has upon those feelings and that imagination the most uniform and the deepest operation. Now, among the primary characteristics of the Grecian system, those which especially demand our attention in relation to the present subject are these two—the absolute overruling power of fate, to which we have already had occasion to allude, and the absence of any clear notion or anticipation of a desirable future state. Were it more immediately to the present purpose, we might here show how thoroughly these two leading principles pervaded the philosophy as well as the poetry of the Greeks—how Stoicism, which we may call the art of endurance, was but a matured fruit of the former conviction, as Epicureanism, the economy of enjoyment, was of the latter—and that it is pretty clear that the most intelligent individuals of either profession united in their conduct these two great branches of practical wisdom. But Christianity reversed this order of ideas. It substituted for the impassive omnipotence of *fate* an almighty *will*, thus making passive fortitude give place to hope and fear; and further, to give to these two grand springs of imagination and enthusiasm, as well as action, the highest exaltation and most unlimited scope, many of those who expounded the Christian doctrines made the happiness of this life an object of contempt rather than of solicitude, representing its very miseries as conducive to the attainment of everlasting bliss. It was a necessary result of the exclusive rigour with which these notions were so long inculcated that the sciences which illumine life and the arts which refine it rapidly expired. Both knowledge and taste might well cease to be cultivated, when their very neglect was held up to mankind in the light in which so many fanatics have represented it, as one means of securing eternal happiness.

And when the strictness with which these principles were interpreted for so many ages began to relax, and men began to think that some effort to ameliorate their worldly state was not inconsistent with the profession or practice of Christianity, the boundless dominion of hope and fear still gave that predominant hue to their imaginations and their passions which they have ever since retained. The fierceness of fanaticism has indeed subsided, but the firmness of philosophy has not succeeded it.

Vain, then, is the attempt to exhibit on a modern stage 'the unconquerable will' of a Grecian tragic hero. The antique spirit animated the Grecian spectator as well as the Grecian poet. But the modern poet has a *romantic* audience, and cannot have any other—an audience that sympathises not with the triumph of will over passion, but with that of passion over will. Well did Shakspeare know this when achieving his grandest tragic successes in Lear, Macbeth, Othello, &c., wherein we see, not the triumph of the hero over fortune and over passion, but that of malignant fortune and conflicting passions over the hero.

In short, an intimate acquaintance with the pervading spirit of that public of his own time from whom his audience must be supplied, is the primary condition of all successful dramatic writing. It is indeed necessarily included in the perfect possession of that highest dramatic faculty which is essential to form a dramatist of the first order; for he must know, or have the sagacity to discover, the habits, mental as well as physical, of all classes and degrees of men, whether the distinctions be marked by difference of race, of country, of rank, of profession, or occupation. He should have a nice perception of the moral distinction between the characters of either sex, and of the modifications which age produces in that of each individual. In fine, he should possess that pervading insight into all the elements of character and all their combinations—that Shakspeare's instinct—which can feel, not only *for*, but *with*, every variety of human nature and human condition.

Supposing that a writer could now arise, possessing the natural powers of a Shakspeare,—what are the principles by which he should be guided in cultivating those powers so as to give them the greatest effectiveness in the present day? We should answer,—Study, on the one hand, [illegible] man and his history; on the other hand, study Shakspeare, but study him on a juster and more liberal principle than has hitherto been followed; study him, above all things, to find how *he* studied human nature and human life;—to discover which thoroughly, his *age*, as well as himself, must be diligently and patiently examined; for the true use of Shakspeare to the artist of the present day is, by viewing his works in relation to his time, to divine, if possible, how Shakspeare would have written for an audience of the nineteenth century. We have neither the space nor the presumption to indicate how he would have done this: but we assert with the fullest confidence that such, and such only, is the mode of studying him calculated to aid the progress and elevate the standard of contemporary dramatic art. This observation, it will be seen, applies more especially to his selection and construction of character and plot, and to the general tone of manners. As regards the amazing force, delicacy, variety, and flexibility of his expression, it is plain that they are much less liable to be studied in an erroneous sense. Happy the writer who should succeed in transfusing their essence into his own diction!

But if a dramatic artist have not this all-comprehensive faculty, which seems given to few, it is, in the next place, important that he should be aware of his deficiency, and should perceive distinctly the nature and limits of the field which his powers really do embrace. Next, in [illegible] to well understanding his public, the dramatist should, if possible, correctly appreciate himself; then, at least, if he do not reach greatness in performance, he will escape absurdity in failure.

Among those orders of dramatic power that fall short of that highest capability which we have endeavoured to characterize, the infinitely numerous and various degrees of deficiency are for the most part assignable to two principal causes: first, to the absence of a lively and delicate sensibility, in some individuals to the serious, in others to the comic, elements of character and plot; secondly, to a limited acquaintance with the diversities of human character and fortune in general. The former deficiency seems in all ages to have been scarcely less prevalent than the latter, and among the early Greeks, as well as among the modern Europeans, was a most influential cause of the two grand dramatic circumscriptions of tragedy and comedy. It is also the defect which it is of the first and most urgent importance that the writer in whom it exists should be thoroughly aware of; since, of all failures in dramatic productions, the exhibition of false wit, and, above all, of false pathos, is the most disastrous. The next great danger to be shunned by the dramatist is that of attempting the delineation of a character, with the features of which, individual, professional, national, &c., he is not completely and accurately acquainted. The judicious selection or contrivance of a plot, which shall be neither languid on the one hand nor improbable on the other, neither too bare of incident nor too crowded with it, and at the same time shall have, if possible, some feature of decided novelty, is next to be attended to. The character and incident of the meditated piece being once clearly determined in the author's mind, the dialogue (supposing him to have the requisite command of diction) will then be a natural, and, as it were, spontaneous result of the series of circumstances under which his personages are brought into contact; and if the latter be really conceived with truth and distinctness, it may indeed be more or less flexible and harmonious, according as the author's mastery of expression is more or less complete, but it cannot fail to be varied and interesting.

Such are the conditions fundamentally requisite for succeeding in any department of dramatic composition. The next class of qualifications arises from an exact and thorough knowledge of the restrictions imposed upon the writer, both as to the literary extent of his composition and the mode of handling his subject, by the very nature of theatrical representation in general. In this respect, it is unquestionable that the peculiar fortune of Shakspeare in being so long a manager as well as a dramatist, contributed materially to that remarkable *theatrical* fitness and compactness of effect which are found in all his mature productions.

And finally, to pass for a moment from the business of dramatic writing to that of acting, let us observe that the theatrical manager, simply as such, ought, no less than the dramatic writer, to be a genuine artist, though in an inferior walk. If true taste and knowledge be wanting in the manager, the best efforts of the dramatist's genius will be marred on the one hand; and on the other, histrionic excellence will neither be brought forward, cultivated, nor encouraged.

ENGRAVING, the art of executing designs by incision upon plates of copper, steel, or other substance, for the purpose of obtaining therefrom impressions or prints upon paper. Although, in this sense of the term, the art is only coeval with that of printing, it has been practised with a more limited object from the earliest periods on record, in a similar manner and with similar instruments to those used at the present time. That an art so abundantly capable of diffusing all kinds of knowledge should have been extensively practised from the most remote antiquity without its applicability to printing having been discovered, is so curious a subject of reflection, that it would be improper to omit giving in this place a slight sketch of its early history.

On referring to sacred history we find in the writings of Moses rather detailed accounts of the character of the engraved works executed in his time, and of the substances whereon they were wrought; nor are we left in ignorance even of the names of the practising artists among the Israelites. Thus from the book of Exodus we learn that when Moses had liberated the Jews from Egyptian bondage, he was commanded to 'make a plate of pure gold, and grave upon it, like the engravings of a signet, holiness to the Lord.' He was also commanded 'to take two onyx stones, and grave on them the names of the children of Israel according to their birth, with the work of an engraver in stone, like the engravings of a signet.' Both these passages distinctly imply the practice of gem and seal engraving, and also of engraving on metal plates, a knowledge of which, among other arts, was, without doubt, acquired by the Israelites during their captivity in Egypt; and specimens of the art as practised in that nation, perhaps at as early a period as that now under notice, still exist. In the book of Exodus also honourable mention is made of one Bezaleel, who appears to have united the callings of the engraver, the jeweller, and the lapidary; and it is said 'that he was filled with wisdom of heart to work all manner of work with the graver, as well as to devise cunning works; to work in gold, and in silver, and in brass, and in cutting of stones to set them.' 'And it was put into his heart that both he and Aholiab might teach them that were filled with wisdom to work all manner of work of the engraver.' These few are selected from numerous other passages in Scripture as sufficiently attesting the practice of several branches of engraving at this early period: from the same source indeed we learn that some of them, as, for example, the engraving of signets, was practised at a time anterior to that of Moses.

From Herodotus (v. 49) we learn that one of the earliest uses to which engraving was applied among the Greeks was the delineation of maps on metal plates. He says that 'Aristagoras appeared before the king of Sparta with a tablet of brass in his hand, on which was inscribed every part of the habitable world, the seas, and the rivers; and to this he pointed as he spoke of the several countries between the Ionian Sea and Susa.' The date of this event was 500 B.C.

The hieroglyphics and other remains of Egyptian engraving are among the most antient relics now extant, and our own British Museum is particularly rich in specimens of them. Some of these are engraved on metal, and have been mostly found in the chests or coffins of mummies. Mr. Strutt in his Dictionary of Engravers describes one of them very minutely. These engravings of hieroglyphics on metal, as well as those on the antient sarcophagi, are evidently executed with similar instruments to those now in use; some of the lines narrowing downwards have clearly been cut with the lozenge-shaped graver now chiefly used; but other lines being of the same width through their whole depth, must have been produced with that species of graver called a scooper, still used for effecting broad incisions.

There is, it must be confessed, some difficulty in determining of what substance the instruments were made with which they engraved on porphyry and jasper, no mode of tempering steel being now known by which it can be rendered sufficiently hard, and at the same time tough enough, to penetrate those substances. Mr. Landseer is of opinion nevertheless that the incisions were produced by patient perseverance with steel gravers impelled by blows with a mallet, and that the work was afterwards rendered smooth by friction with some hard substance pulverized (such as the powder of the corundum stone) and applied with lead.

But it is believed that some of the relics of Etruscan art in the British Museum are of as high antiquity as any existing specimens of engraving. Mr. Strutt gives a description of two of these, the one a parazonium or dagger sheath, on which is represented a story from Homer; the other is supposed to be a patera or instrument used by the priests in their sacrificial ceremonies. This latter is rather a specimen of sculpture than engraving, being embossed in high relief; but portions of the drapery and hair on the figures are evidently executed with the graver. Mr. Strutt is of opinion that the subject is the combat between Hercules and Hippolyte, the queen of the Amazons, 'whose girdle he was enjoined by Eurystheus to unloose and take from her.' Others have supposed that it represents Minerva leaning on the head of Hercules and urging him forward in the paths of glory. It is apparently of brass, seven inches in diameter and about half an inch thick, and is declared by Mons. D'Hancarville to be, 'without contradiction, the richest and most remarkable remnant of antiquity, and of all the Etruscan bronzes the best executed and most happily preserved.' The circumstance of the inscription running from the right hand towards the left furnishes additional testimony of its great antiquity. The dagger-sheath is thus described by Strutt:—'It is more than three inches and three quarters wide at the top, and decreases gradually to an inch and a quarter at the bottom. Its present length is eight inches and a half. The story engraved upon it appears to be taken from Homer. The trophy at the bottom is symbolical of war. Above the trophy two warriors are delineated with a woman, who seems to accompany them with great reluctance; which I conceive may represent Paris, with his accomplice, conducting Helen to the ship, in order to make their escape to Troy; and at the top, the messenger, a servant of Menelaus, is relating to his lord the ungrateful behaviour of his Trojan guest. The figures are exceedingly rude, and seem to indicate the very infancy of the art of engraving, for they are executed with the graver only upon a flat surface, and need only to be filled with ink and run through a printing-press (provided the plate could bear the operation) to produce a fair and perfect impression. The print so produced, says Mons. D'Hancarville, would certainly be the most antient of all that are preserved in the collections of the curious, and demonstrate to us how near the antients approached to this admirable art, which in the present day forms so considerable a branch of commerce. We may indeed say, that they did discover it, for it is evident from the valuable relic before us that they only wanted the idea of multiplying representations of the same engraving. After having conquered every principal difficulty, a stop was put to their progress by an obstacle which, in appearance, a child might have surmounted.' Prints which indeed we have ourselves seen, taken with ink from Etruscan specula, of which there are several in the Museum, sufficiently prove the capacity of these early engravings to deliver impressions.

But while the world was so slow to discover a mode of taking impressions from engraved works, on substances offering natural facilities for such an object, the art of impressing more obdurate substances appears to have been understood and practised at a very early period in most parts of the civilized globe. This is evidenced in the practice of numismatic engraving, or the art of sinking dies, from which coins are impressed, which is of very antient although uncertain origin. The mode of impressing the metal was by the stroke of a hammer, the die or engraving being cut on a sort of punch; and it is remarkable that the operation of coining is performed in the same manner at the present time, in such parts of the globe as are backward in improvement. The first Greek coins were struck, according to some authors, at Ægina, by Pheidon, king of Argos, about eight centuries before the Christian æra. But this is a much less remote antiquity than what is ascribed to other antient coins. Mr. Landseer describes a gold coin in the collection belonging to the East India Company, to which the Hindoos ascribed an antiquity of 4000 years, and paid it superstitious homage. It is understood to have been dug up near the royal palace of Mysore, and was found among the treasures of Tippoo Sultan. In Rome, a mint every way commensurate with the greatness of the empire was established in the reign of the emperor Augustus. The extravagant fondness of the Roman matrons for engraved gems was satirised by Juvenal, and gave rise to the remark of Pliny, that they 'loaded their fingers with princely fortunes.' This profusion gradually extended itself to the wearing apparel of both sexes; and among the opulent classes almost every article of use or dress glittered with engraved gems.

In the peninsula of India, also, the art of engraving on plates of copper appears to have been practised long before the Christian æra. It would appear that it was there customary to ratify grants of land by deeds of transfer actually engraven on plates of copper, as we now write them on skins of parchment. A copy of one of these very interesting relics is given with an English translation by Mr. Wilkins, in the first volume of the Asiatic Researches, page 123. It is in the Sanscrit language, and bears date twenty years before the birth of Christ.

The engraving of signets, although considered by many to be rather a mode of sculpture than of engraving, is sufficiently allied to it to claim a slight notice in this place; the more so, as being of higher antiquity even than die-sinking. Mention is made of the use of signets in the sacred writings as early as the time of the patriarchs. They were then probably engraved on metal, and appear to have been used at this time, and at all subsequent periods, as instruments of ratification. When through the dark ages the knowledge of the Roman sealing substance was lost, recourse was had to lead, as a substitute for wax, to receive the impressions. The emperor Charlemagne wore his signet in the pummel of his sword; and it was in allusion to this as an instrument of ratification that he was accustomed to say, 'With the point I will maintain that which I have engaged with the hilt.'

The state of engraving in our own country previous to the Conquest must not be entirely overlooked. Our knowledge of it is principally derived from such ornaments of dress as buckles, clasps, rings, and military accoutrements, sometimes found in antient tumuli. These frequently bear the marks of the graver: but if other proofs were wanting their coins would sufficiently attest their knowledge of the art; for although exceedingly rude, they are evidently impressed from engravings cut upon iron or steel. 'Under the protection of that good and excellent monarch Alfred the Great (says Strutt), the arts began to manifest themselves in a superior degree, notwithstanding the load of intestine troubles which destroyed the nation.' The works of the Anglo-Saxon goldsmiths, who were the principal engravers of that day, were held in the highest estimation; and there is yet preserved in the museum at Oxford a very valuable jewel made by command of Alfred, and which was indeed one of the few treasures which he took with him when he retreated to the Isle of Athelney, where it was found. It is of gold, richly adorned with a kind of filligree work, in the midst of which is the half figure of a man, supposed to be St. Cuthbert. The back of this jewel is ornamented with foliage, and is pronounced to be very skilfully engraved, on the authority of Mr. Strutt, who has given a faithful representation of it in the second volume of the Chronicles of England.

'Soon after the Conquest,' (according to the authority just quoted, but we ourselves have never met with a specimen of earlier date than A.D. 1284,) 'a new species of engraving was introduced into England, much more perfect in itself than any which had preceded it, and in every respect distinct from the work of the carver or chaser.' The author alludes to the engraving of the sepulchral brass-plates, so frequently found in our churches upon the tomb-stones. Their economy, as compared with the carved images which preceded their introduction, probably brought them into such general use that very few churches in this country are without them. They are executed entirely with the graver, and in precisely the same manner that a copper-plate is now engraved that is intended to be printed from, but as they were commonly exposed to the feet of the congregation, the strokes were cut deep, that they might endure the longer, and consequently very neat workmanship is not to be expected. Some of them, however, bear evidence of considerable ability in the workmen by whom they were executed; but who these workmen were is quite unknown. It has been conjectured even, that they were not produced in England at all, but executed by foreigners, who took British produce in exchange for their labours. However this may be, certainly no churches more abound with them than those of this country; but we have never met with more than one, even with a *monogram*, and that is insufficient to lead to a knowledge of the artist, who was not improbably, in this and in most other cases, an ecclesiastic.

We now approach the period when the invention of *printing* gave to engraving a new direction, and produced an effect on the civilization of the world as astonishing as it is incalculable. The chief obstacle to printing had already been removed by the manufacture of paper from linen rags, which had become generally known in Europe at the latter end of the fourteenth century. It must be remembered, as giving additional interest to this subject, that it is to a certain class of engravers that we are immediately indebted for the first printed books, which were actually impressed from engraved wooden tablets—a method which was afterwards improved by substituting movable metal types; and thus the arts of engraving and printing, at the same time that they constitute the sole means by which all kinds of knowledge may be extensively diffused, have placed it within the power of us all to possess the best thoughts of the best men in literature, science, and art.

The first prints, as we have already intimated, were obtained from engraved wood blocks. This might naturally be expected, because the process of printing from such works is so simple and obvious, not requiring even a press, that persons of reflection are astonished, not that printing was invented so soon, but that it had not been discovered sooner. To obtain impressions from the incised hollows of an engraved metal plate, on the contrary, is a much less obvious process, requiring the aid of a somewhat complicated machine, called a rolling-press. We need not wonder, therefore, that its discovery should have been later; and indeed, the two processes are so very different, that when one was discovered it did not lead necessarily to the other.

The earliest print with a date attached to it is one known as the St. Christopher, which is from a wood block, and dated 1423; but no impression from an engraved *plate* has been found with a date anterior to 1461. The art of engraving on metal plates for taking impressions on paper was, according to Vasari, first practised by Maso or Tommaso Finneguerra, a Florentine goldsmith, about the year 1460; and although many writers have advocated the claims of Germany to the honour of the invention, it seems now to be conceded by nearly universal consent to Italy. The arguments of the Abate Luigi Lanzi, in his work on the history of painting in Italy, appear to us to be quite conclusive in confirmation of Vasari's opinion. However this may be, there has never existed a doubt that the art had its origin in the workshops of the goldsmiths about the middle of the fifteenth century. Many of these goldsmiths were *niellatori*, or workers in *niello*—a mode of ornamental engraving usually performed on silver plates—the design engraved on which was afterwards filled in with a black composition, said to have been composed of silver and lead, which from its dark colour was called by the antients nigellum, a word curtailed by the Italians into niello. This being incorporated with the silver, that is, run into the engraved lines, produced the effect of shadow, and had very much the appearance of a print. 'These nielli, says Lanzi, 'were used as silver ornaments to articles of furniture, sacred vessels, such as holy cups and vases, to missals and other devotional books, and to reliquaries; as well as to profane purposes, as adorning the hilts of swords, table utensils, and many kinds of female ornaments.' Now Maso Finneguerra was a worker in niello, and, according to Vasari, his discovery of the art of printing from engraved plates was the result of accident. It was usual with the artists who worked in this style to rub a mixture of charcoal and oil into the design engraved on the silver plate, that they might ascertain what would be the effect of the work previous to inlaying with the nigellum or mixture of silver and lead. It is said that on one occasion Finiguerra, having rubbed in the charcoal and oil, by way of thus proving his work, accidentally let fall upon it some melted sulphur, which upon removal brought with it the ink out of the hollows and exhibited the exact impression of his work. It occurred to him to try if the same result would follow on a piece of moistened paper if laid over the design thus filled with ink, and pressed by a roller. The experiment succeeded; and the consequence was the gradual improvement of the new art both in his hands and those of Baccio Baldini, Sandro Botticelli, Antonio Pollajuolo, and Andrea Mantegna, to whom he communicated the process. Other accounts, however, make the discovery of chalcography much less the result of accident. According to these, *Finiguerra*, as well as other workers in niello of his time, were in the habit of proving their works by means of *sulphur casts* previous to the ultimate inlaying. For this purpose the engraved plate was pressed with earth or clay, upon the top of which some melted sulphur was then thrown, which on removal presented a facsimile of the work on silver; into the lines of this sulphur cast some fatty black was then rubbed, and the artist was thus enabled to form a correct opinion of the progress and perfection of his work. These facts are now placed beyond all doubt by the discovery of some sulphur casts from the niello of Finiguerra, although there is no fully-authenticated impression upon paper from any plate engraved by him. Thus it would appear that the workers in niello were long advancing on the verge of this invention. Engraving was henceforth to constitute a distinct and honourable profession, or to have those energies further developed by the greatest masters of design which had hitherto only maintained a feeble existence in the workshop of the goldsmith.

Our limits will not allow us to dwell on the merits or performances of these early masters, contemporaries of Finiguerra, to whose exertions we are nevertheless much indebted for the rapid approaches of the art towards excellence. Of these Baldini, Botticelli, and Andrea Mantegna, have already been named among the Italians; and while we disallow the claims of the Germans to the discovery of copperplate engraving, we willingly admit that it was very early and very greatly improved in that country by Martin Schoen, Israel Van Mechelin, Leydenwurf, and Wolgemut. This is not surprising when we reflect that wood engraving had been first practised there, forty years earlier, and consequently that they had anticipated the Italians in a knowledge of printing-ink and the press; nay, it is remarkable that the first *book* printed at *Rome* (an edition of Ptolemy's Geography) was also illustrated by the first *plate engravings*, twenty-seven in number, which were maps, and were executed there by two Germans, Sweynheym and Buckink; the latter completing what the former left unfinished at his death. This work is dated 1478, but was commenced in 1472.

One of the first books illustrated with designs on engraved plates was indeed the production of Italian artists; this was an edition of Dante's 'Inferno,' published at Florence in 1481, and embellished with engravings by Baccio Baldini, after the designs of Botticelli. It is worthy of remark that these plates were not printed on the same paper as the letter-press, but blank spaces were left at the head of each canto, over which the prints were pasted. As we believe the greatest number of embellishments ever found in a copy of this work does not exceed nineteen, it is to be presumed that the intended series of illustrations was never completed. Omitting further notice of those early masters who flourished at the end of the fifteenth, we shall pass on to the sixteenth century, at the commencement of which the art was carried to a very high degree of excellence; in Italy by Marc Antonio Raimondi, and simultaneously by Albert Dürer in Germany, and Lucas Van Leyden in Holland; a constellation of talent, the appearance of which marks the most memorable epoch in the history of engraving.

Marc Antonio, like so many of his predecessors, was originally a worker in niello, in which art he was instructed by Francesco Francia, and acquired considerable skill; but quitting it for engraving, as usual, he at first copied some of the works of his master, and afterwards imitated those of Andrea Mantegna and Albert Dürer. He finally perfected himself in design under Raphael d'Urbino, who appreciated his talents so highly as to lend him every assistance; he even permitted his own printer of colours to manage the press for him, that he might devote his time wholly to the more intellectual parts of the art.

The great merit of Marc Antonio lay in the correctness and beauty of his outline; so great is his excellence in this respect, that it is believed that Raphael himself assisted him with his own hand on the copper. The character of his heads is admirably preserved, and the extremities marked with the truest precision; but his lights are not enriched with that variety of fainter tones which indicate local colour, nor do his prints possess the harmony arising from the chiaroscuro or the beauty of reflex light. The consequence is somewhat of monotony in his darks and baldness in his lights, which produce an appearance of hardness; but the rude state in which he found engraving must be remembered in forming an estimate of his merits, nor should it be forgotten that the then recent disinterment of the great works of antique sculpture and the fame of Raphael and of Michael Angelo rendered *form* and *character* the great objects of pursuit, as they were indeed at that time, from those causes, thought to be the only ones worthy of consideration.

Thus happily favoured with the patronage, instruction, and friendship of the 'divine Raphael,' he devoted himself almost exclusively to engraving after his matchless productions; and although, as we have seen, his prints want so many of the embellishments and conventionalities of more modern art, and are more deficient in these respects even than his contemporaries of the school of Germany and Holland, yet such was the truth and purity of his outline, that it is doubtful if the works of Raphael have ever since been rendered with so much justice to their author. M. Antonio died about 1527. Our space will not allow even a list of the engravers and painters who engraved or etched (a mode of engraving hereafter to be described) who flourished in Italy during the two centuries which succeeded the death of Marc Antonio: the principal of these however were Agostino de Musis, Marco da Ravenna, Caraglio, Giulio Bonasone, and Enea Vico, all pupils of Marc Antonio; Giorgio Ghisi of Mantua and his relatives Diana and Adam Ghisi, Cornelius Cort, &c. &c. But although by these and others the executive part of the art was continually though slowly improved, their powers in design or drawing, (in which the chief excellence of the school at all times consisted) declined, at least as fast as they advanced in mechanical skill, until at length in the 18th century the intellectual and mechanical excellencies of the art were united in the works of Jacomo Frey; and from that time the credit of engraving in Italy has been well maintained by succeeding artists. The names of the principal painters who have practised engraving in Italy are Agostino Caracci, Stephano della Bella, Spagnoletto, Guercino, Salvator Rosa, Claude Lorraine, Swanevelt, Canaletti, Piranesi, &c. &c.

In Germany engraving made more rapid strides towards excellence, in the mechanical parts of it; and at the commencement of the 16th century appeared Albert Dürer, a man whose universality of talent extended the boundaries of every department of art, and carried all to a degree of perfection previously unknown in that country. The defects of Albert Dürer, who was a painter as well as an engraver, were the defects of the school to which he belonged; the dry and Gothic taste of which is equally observable in their paintings and engravings. But in all that relates to the executive part of the art of engraving the works of Albert Dürer deserve the highest praise. The Italian artists having the finest specimens of antique sculpture constantly before their eyes, appear to have been very early impressed by them with a sense of the beauty of flowing lines; and perhaps nothing is so well calculated to convince us of the advantages to be derived from the study of the antique sculptures as a comparison of the works of German and Italian artists. The draperies, for instance, in the German works, are represented by abrupt rectangular forms, and have been well described as *broken*, rather than *folded*; resembling the appearance of crumpled-up paper more than drapery. The pains which they evidently bestowed upon their works forbid us to ascribe that to want of attention which was certainly the result of a vitiated taste in design.

Albert Dürer had great command of the graver, and carried his plates to a much higher degree of finish than his Italian contemporaries, as his print of 'St. Jerome in the Room,' as it is called, the execution of which has scarcely ever been exceeded, will sufficiently attest. To his other honours we have little hesitation in adding that of being the inventor of etching by corrosion, an art which has contributed most powerfully to the perfection of engraving. We are aware that the discovery of etching has been by some attributed to Michael Wolgemut, the master of A. Dürer, but we never heard of any etching from his hand having been seen; nor do we know of any etching by any other hand which bears date so early as the celebrated Cannon landscape, by Dürer, which is 1518; while from his own hand we have two others still earlier, viz. Christ praying on the Mount, 1515; and the Rape of Proserpine, 1516. All these were evidently performed in the very infancy of the art, before the discovery of stopping out, as it is called, an expression which will be intelligible to the reader on a reference to our account of the process of etching. On examining the etchings of Albert Dürer, we see that they have all been corroded at one biting in; which sufficiently explains their monotonous appearance, and proves that stopping out was not understood, or it would have been had recourse to, as its advantages could not have been overlooked. It is most probable that the defective and monotonous tone occasioned by the want of this knowledge is the reason that so few corroded etchings were executed by Albert Dürer, who must have been otherwise fascinated by the facilities which this mode of engraving offered; as it is, his corroded etchings are much inferior to his other works, both on copper and wood.

The principal German engravers, after Albert Dürer, are his pupil, Henry Aldegraver, together with Bartholomew and Hans Sebald Beham, Albert Altdorfer, James Bink, George Penz, Virgil Solis, &c. &c. But the history of pure German art is very short, for most of these German engravers travelled to Italy for improvement, attracted by the fame of Marc Antonio; several of them are indeed his reputed disciples; and the consequence is, that the two schools may be said to have immediately, in some measure, blended; as under the influence of Italian taste the peculiar characteristics of German art in a great measure disappeared. From the small size of most of the works produced by these German engravers, they are generally distinguished as the 'little masters,' although many large plates were executed by them.

Lucas Jacobs, best known by the name of Lucas Van Leyden, was the father of the Dutch and Flemish schools, and the contemporary and friend of Albert Dürer, whose defects he fully possessed, while he fell short of his excellencies. The same vulgarity of form, and general want of grace and propriety of design, which has been noticed in the German school, is equally observable in the works of Lucas Van Leyden; while they are deficient in the spirit and firmness which characterize the works of Dürer. But notwithstanding these drawbacks he was a man of great abilities. After Lucas Van Leyden the art was maintained in the Low Countries by the Wierinxes, the Sadelers, whose works are multifarious, and embrace every class of subject; the elder and younger Jode, Cornelius, Theodore, and Philip Galle, and Abraham and Cornelius Bloemart. The latter, perhaps less actuated by the commercial spirit in which the art was at this time practised, attempted improvements with success; and by working delicate tints on the lights, which had hitherto been left only as so many white spots, he brought his works to a degree of finish and harmony not previously attained. This artist studied and indeed died at Rome, whither also Goltzius travelled for improvement, who imparted a boldness to engraving which forms a striking contrast to the neat stiff manner of his predecessors. Goltzius was a man of great abilities, and drew the human figure admirably; but in endeavouring to avoid the dry Gothic taste of his countrymen, he went into the opposite extreme, and aiming at the sublime of Michael Angelo, took the one step beyond, and occasionally fell into the ridiculous. The same observations will apply to the works of Sprangher; and these faults were exaggerated and carried to the extreme of bombast by the disciple of Goltzius, Müller; but the freedom with which he handled the graver is truly surprising. To these succeeded Lucas Killian, Matham and Saenredam; and at the commencement of the seventeenth century the two Bolswerts, who had formed their style on that of Goltzius, improved themselves under the instruction of Rubens.

Etching, at this period, was practised by many of the painters in the Low Countries with great success; and we need scarcely say, that it is principally to this process that we are indebted for those treasures of art, the engraved works of Rembrandt: not that in his finished works he confined himself to etching; he also called in the assistance of the graver and the dry point. His etchings being very numerous, are of unequal merit; and many, the subjects of which are of a sacred or dignified nature, are debased by the vulgarity of the characters introduced: but notwithstanding these and other defects, his best works are greatly and deservedly prized, for they are inimitably fine, and possess the excellencies of the best paintings, even by his own hand, in a degree not equalled by the works of any other engraver. To mention the artists of this school from whose hands we have etchings would be to name nearly all the most eminent painters belonging to it. Berghem, Cuyp, Karel du Jardin, Paul Potter, Ruysdael, Ostade, Waterloo, Adrian Van de Veldt, with many others, have all enriched the portfolio of the collector with works of great taste and spirit. Among the more professedly engravers not already noticed we must mention Count Goudt as possessing extraordinary skill, although he cultivated the art less as a profession than for pleasure. The family of the Visschers produced many and excellent works, from the pictures of various masters; and Cornelius Visscher stands particularly distinguished for the accuracy of his drawing and the fidelity with which he has rendered the character of the pictures after which he engraved.

In France engraving has been practised with pre-eminent success in the departments of history and portraiture. The celebrity of the school dates from the time of Louis XIV.; for although several engravers had appeared before that time, it was only under the fostering influence of that monarch, assisted by the fine taste of Colbert, his minister, that a school arose surpassing in excellence any which had preceded it. The family of the Audrans produced six eminent engravers, but of these the most distinguished was Gerard Audran. He was an admirable draftsman himself, but the great excellence of his works in other respects was enhanced by the absence of all *manner*, except such as belonged to the painter after whom he engraved. He was the first engraver who successfully united, to any extent, the use of the graver and the etching point, and by thus availing himself of the facilities arising from the use of the aquafortis, produced numerous works of great excellence, and some of prodigious size, among which we may mention the battles of Alexander, after Le Brun, each subject of the series being engraved on three or four large plates. The Abbé Fontenac remarks of him that, 'far from conceiving that a servile arrangement of strokes, and the too frequent cold and affected clearness of the graver, were the great essentials of historical engraving, he gave worth to his works by a bold mixture of free hatchings and dots, placed together apparently without order, but with an inimitable degree of taste, and has left to posterity most admirable examples of the style in which grand compositions ought to be treated.'

Gerard Edelinck, although born at Antwerp, may be fairly considered of the French school, and was an engraver of the highest order. In portrait Nanteuil is no less celebrated than his contemporaries: the beauty and clearness of his style has perhaps never been exceeded. The Drevets (Peter Drevet in particular) are scarcely less distinguished; nor must we omit the name of John Louis Roullet, whose engraving of the 'Dead Christ with the fainting Virgin,' after Annibal Carracci, is one of the finest specimens which the art has produced. In addition we can only notice the names of Le Clerc, Simoneau, Chereau, Cochin, Dupuis, Beauvais, Balechou, Le Bas, John George Wille, &c. &c. The modern and existing French school has produced very able engravers, whose chief defect is, that, deviating from the course pursued by Gerard Audran and all the great artists, they allow that which is merely mechanical to predominate in their works; and aiming at great dexterity in the use of the *graver* as the chief objects, they make an ostentatious display of lines, the uniformity and regularity of which is offensive to the eye of true taste, imparting, as it often does, even to the flesh, the appearance of net-work, when viewed closely.

The English school of engraving dates only from about the middle of the eighteenth century, previous to which time the arts had not flourished indigenously in our country, and such engravers as practised here were chiefly foreigners. With a school of painting however has arisen an assemblage of engravers in all the departments of art who may safely challenge comparison with those of any time or nation. It is true we had previously the Faithornes, Payne, and the Whites; but Hollar, Simon and Crispin de Passe, Wallerant Vaillant, Blooteling, Gribelin, Dorigny, and Vanderbank, were all foreigners; and the principal engravings of the time were their productions.

The reign of George III. was however auspicious to the arts, and since then we can boast of a numerous train of engravers whose works do honour to the country and to the painters from whose works they are engraved. One of the earliest of these was Hogarth, an artist of most original genius, whose engravings were all from his own designs, in a walk of art entirely new. Landscapes had hitherto never been engraved in a satisfactory manner, the older engravers adhering to the use of the graver *only*, which was inadequate to express with sufficient freedom the playful luxuriance of foliage, the ruggedness of rocks, or the dash of foaming water. These objects were first accomplished by Francis Vivares, who was a most accomplished etcher, and may be regarded as the father of English landscape engravers, who have unquestionably surpassed all their predecessors in this department of art. Woollett followed in the same track, carrying his landscapes very forward with the etching point, and finishing them only with the graver. His best works are unrivalled; nor was he inferior in history, as his print of the death of General Wolfe, after West, sufficiently attests.

These two artists carried landscape engraving at once to perfection. Browne may be mentioned as a worthy follower; he produced many excellent plates after the old masters, and sometimes worked in conjunction with Woollett. In history and portrait Sir Robert Strange ably vindicated the honour of the art in this country: his engraving of flesh has perhaps never been equalled, certainly never excelled by any master; his works are however often much deteriorated by his defective drawing. Mezzotinto engraving, although not strictly born among us, has been in no other country practised with a degree of success at all approaching that attained by M'Ardell, Earlom, Smith, Valentine Green, and others. Bartolozzi, Ryland, Sharpe, Paul Sandby, Middiman, Milton, Fitler, are among the most eminent of deceased engravers; and Mr. Wilson Lowry is entitled to most honourable mention as a great benefactor to the art, by the invention of the ruling-machine, an instrument of great value for many purposes, and the operation of which is perfect. At present every department of engraving is filled with artists of great abilities, any of whom it would be invidious to name to the exclusion of others: it is enough to say that their talents and their numbers have given the art a commercial importance in this country to which it never attained in any other.

A modern engraving is usually the result of two processes, viz. of direct incision with the graver, or the dry point, and of etching by corrosion. These we shall proceed to explain; and first we will enumerate and point out the uses of the different implements required. The principal instrument is the *graver*, or *burin*, which differs in size and shape according to the character of the line which it is intended to produce, but the ordinary graver is of the form of a quadrangular prism, both square and lozenge-shaped, and fitted into a short handle, the whole being about five inches and a half long. The square graver is used in cutting broad lines, and the lozenge-shaped for more delicate ones. In making the incision, it is pushed forward in the direction of the line required, being held by the handle at an angle very slightly inclined to the plane of the copper. It is requisite that the graver be well tempered, and great address is necessary in whetting it for use. The angle at the meeting of the two lower sides of the graver forms what is called its belly, and the breadth of the end is called its face. The two sides which form the belly are to be laid flat upon the oil-stone, and rubbed firmly until the belly slightly rises, so that if it were laid flat upon the copper the light could be seen underneath the point; otherwise it would be impossible to use it with freedom, as it would dig unequally deep into the copper. The face is next to be whetted, which is done merely by laying the face of the graver flat upon the stone, with the belly upward, and rubbing it steadily upon a moderate slope until it acquires a very sharp point, taking care that the stone be properly supplied with oil all the while. The gravers sold in the shops are commonly too hard for use, which is known by the frequent breaking of their points: when this is the case they should be tempered by holding them on a red hot poker at a distance of half an inch from the point, until they acquire a faint straw colour; they should then be put into oil to cool; or they may be tempered in a candle and cooled in the tallow. But it is best not to be hasty in tempering; for if the graver is only a little too hard, whetting alone will frequently bring it into good condition. An instrument called a *scraper* is required to scrape off the bark or burr which is formed by the action of the graver and dry point. The *burnisher* is used to polish the plate and to erase any scratches which it may accidentally receive, and also to make lighter any part of the work which may have been made too dark. An *oil-stone* is requisite for sharpening the instruments upon. *Etching points* or *needles* are nearly similar in appearance to sewing-needles, but fixed into handles four or five inches long; some are made of an oval form, to produce broader lines with: their use will be explained when we are describing the process of etching. *Dry point* is, in fact, nothing more than the common etching-needle brought to a very fine point. It is used to cut or scratch the more delicate lines with, such as skies, &c. &c. It does not, like the graver, cut the copper clean out, but throws it up on each side of the line produced by its progress through the metal: this is called the burr, which is removed by a scraper. This burr was left on by Rembrandt, until it wore away in the progress of printing, which it soon does; but by his management it added greatly to the effect of the etching, and impressions from his works with the burr on are much valued. A *cushion* is a bag of leather filled with sand; its use is to support the plate so that it may be freely turned in any required direction; but it is not now much used by artists, being chiefly confined to engravers of writing. A *rubber* is a roll of cloth tied up tight, one end being kept in olive oil. It is useful to polish off more completely the burr and also to show the appearance of the work as it proceeds.

Etching is one of the greatest improvements in modern art, almost all plates of every size and description being now commenced by this process, and indeed brought by it to a very considerable effect, and afterwards carried on to the necessary degree of finish and strength with the graver and dry point. Etching is the superaddition of the chemical process of corrosion to drawing, when performed on a plate of copper over which a substance called *etching-ground* is laid, and through which the design is traced with an etching-needle, so as to expose the surface of the copper wherever it has passed. This etching-ground is a substance composed of wax, asphaltum, gum mastic, resin, &c. incorporated by melting over a fire, and capable of resisting the action of aquafortis. The *laying of the ground*, as it is called, is thus effected:—The plate must be heated over a charcoal fire, so that it may not be smoked. For this purpose a hand-vice is fixed to the most convenient part of the plate, by which it may be held in the hand. A piece of the etching-ground, rolled into the form of a ball, and tied up in a little silk bag, is then rubbed over the surface of the plate, the heat of which causes the ground to melt and come through the silk on to the copper. In order to effect a more equal distribution of the wax, a small dabber made of cotton wool, tied up in a piece of taffety, is quickly dabbed all over the face of the plate while yet warm, so as to leave the wax or etching-ground of uniform thickness; the ground is then rendered black, by being held over the smoke of a wax candle, or, if necessary, two or three wax candles tied together, care being taken to move the plate about, so that it be equally smoked all over; and this operation of smoking must be commenced before the plate has had time to cool. The whole operation of laying the ground requires address and dexterity. When cold, the plate is now ready to receive the design. To transfer the design to the copper, an outline is made with a black-lead pencil on a piece of thinnish and even paper, and laid with the face downwards on the etching-ground; the whole is then passed through a rolling-press, the effect of which is to transfer an impression of the outline on to the smoked ground. After this the design is completed with the etching needles, which remove the ground from the copper wherever they pass, and expose it to the action of the acid during the process of biting in, which is thus performed:—A substance called *banking wax*, which when cold is quite hard, but which on immersion in warm water becomes soft, and may be moulded into any form, is first rendered soft by being so immersed in warm water, and then banked up all round the margin of the plate, so as to form a trough capable of preventing the escape of the acid, a gutter only being formed at one corner for the purpose of pouring it off when requisite. This being done, the nitrous acid, reduced with water to the proper strength, is poured on, and its action on the copper becomes visible by the rising of innumerable bubbles. The aquafortis must be allowed to continue on the plate until the fainter parts are supposed to be corroded sufficiently deep; after which it is to be poured off, the plate washed with water and left to dry. The parts which are bitten-in enough, are now to be covered with what is called *stopping-ground*, which is a mixture of lamp-black and Venice turpentine; this is applied with a camel-hair pencil, and allowed to dry. After this the acid is again poured on, and this process of *stopping-out* and *biting-in*, is repeated until even the darkest parts are sufficiently corroded. After this the plate is again warmed, when the border of wax may be readily taken off. It is then made warm enough to melt the ground, which is removed by being wiped with a rag and a few drops of olive oil. The work is now complete, unless it is intended to finish it still further with the graver. We might here offer rules for the strength of the acid, and state the length of time it ought to remain on the plate, but we are convinced of the inefficacy of such instructions. Nothing but experience joined to some chemical knowledge of the effect of the acid will avail the artist on this point, which requires the greatest nicety and attention.

Etching on soft ground is a mode of etching formerly much in use, by which imitations of drawings in chalk and pencil were produced. It is now superseded by lithography, which is more successful in attaining the same objects. Soft ground etching is quite a distinct process from

Engraving in stipple, as practised by Bartolozzi, Ryland, and others, in imitation of chalk drawings of the human figure. Stipple is performed with the graver, which is so managed as to produce the tints by small dots, rather than by lines, as in the ordinary method. It is very soft in its effect, but is on the whole much inferior to the more legitimate mode of engraving.

Engraving on steel and *etching on steel* are performed in the same manner as on copper, for which steel has of late years been often substituted on account of its yielding a greater number of perfect impressions, owing to its superior hardness.

Medallic engraving is a species of etching lately practised by M. Collas and Mr. Bate. By this mode very beautiful representations are obtained of medals, &c., by means of a machine of peculiar construction, the principle of which is known; but minor inventions for the purpose of counteracting certain local tendencies to inaccuracy in the machine have been hitherto kept secret.

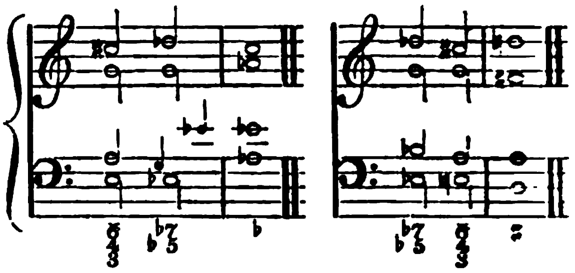
For account of *engraving on stone*, see LITHOGRAPHY; and for *engraving in mezzotinto*, see MEZZOTINTO.

Etching on glass is performed by laying on the glass a ground of bees' wax, and drawing the design thereon with the needle, as in etching upon copper. Sulphuric acid is then poured on, and fluor spar, or fluoric acid, sprinkled on it. After four or five hours it is taken off, and the work cleaned with oil of turpentine.

ENGROSSING; copying in a large hand; the writing a deed over fair, and in proper legible characters; from the French *grossir*, to make bigger. Among lawyers it more particularly means the copying of any writing fair upon parchment or stamped paper.

In statute-law *engrossing* means the purchasing of large quantities of any commodity, in order to sell it again at a high price. ('An Inquiry into the Laws, antient and modern, respecting Forestalling, Regrating, and Ingrossing: together with adjudged Cases, Copies of original Records, and Proceedings in Parliament relative to that subject:' by William Illingworth, 8vo., Lond., 1800.)

ENHARMON'IC, the third in order of the three genera of antient music. The enharmonic genus of the Greeks was distinguished by quarter tones, while the modern scale admits these small intervals theoretically only, not practically, except by a fiction. Thus C sharp and D flat are with the moderns practically the same note, at least on keyed instruments, though, strictly, the former is $\frac{24}{25}$ of the whole string sounding C, the latter $\frac{15}{16}$. The passage from one to the other of these intervals is called an *enharmonic change*, and a change of key so effected is designated by the term *enharmonic modulation*. Examples:—



ENHYDRA. [OTTER.]

ENIGMA. [ÆNIGMA.]

ENLISTMENT, an engagement to serve as a private soldier either during an unlimited period or for a certain number of years, on receipt of a sum of money. Enlistment differs from enrolment, inasmuch as it is a voluntary act, whereas the latter is, under some circumstances, rendered compulsory: as in the case of men who are selected by ballot for the militia in this country, or by the conscription, for military service generally, on the continent.

The practice of impressing men to serve as soldiers, on sudden emergencies, was formerly very common in England; and it is well known that within the last half century young men were entrapped and secretly conveyed away to recruit the armies employed in the east. The discovery of this illegal and disgraceful method of obtaining soldiers was speedily followed by its abolition; and now, the East India Company's troops, as well as those of the regular army, are obtained by voluntary engagement.

The number of young men who are induced to enlist by the ambition of entering upon a course of life which appears to hold out a prospect of distinguishing themselves by gallant achievements in the field is, however, too small for the wants of the military service; and the allurement of a bounty must necessarily be presented in order that the ranks of the army may be filled. But the profession of a soldier can never possess such advantages as might induce an industrious man who can obtain a subsistence in another way to embrace it; and it is to be regretted that too frequently those who enter the service are thoughtless youths or men of indolent habits or desperate fortunes. Some attention, however, to the character of a person offering himself for enlistment is necessary if it be desired to render the service honourable; for it is found that idle and dissipated men are with difficulty brought to submit to the necessary restraints of discipline; their frequent desertions entail heavy losses on the government, and they often corrupt those who are compelled to associate with them. When circumstances render it necessary to enlist such men, it is obvious that they ought to be distributed in small numbers among different regiments, and quartered in places remote from those from which they were taken.

By the 34th clause of the Mutiny Act, every person who has received enlisting-money from any military man employed in the recruiting service is considered as having enlisted; but within forty-eight hours afterwards notice is to be given to the recruit, or left at his place of abode, of his having so enlisted; and again, within four days from the time of receiving the money, the recruit, attended by any person employed as above-said, is to appear before a magistrate (not being a military man), when, if he declare that he has voluntarily enlisted, the magistrate is to question him concerning his name, age, and condition, and particularly to inquire of him whether he is then serving, or whether he have ever served, in the army or navy. The magistrate is then to read to the recruit the articles of war relating to mutiny and desertion, and administer to him the oath of allegiance, of which a form is given in a schedule to the act: if the recruit refuse to take the oath, he may be imprisoned till he do so.

But as the young and simple have been sometimes inveigled by illusory promises, or persuaded, while deprived of judgment by intoxication, to enlist, if a recruit, on reflection, wish to withdraw from the engagement into which he may have been surprised, it is provided by the 3 clause of the Mutiny Act that when taken before the magistrate as above he shall be at liberty to declare his dissent from such enlistment; on making which declaration and returning the enlisting-money, with 20s. in addition for the charges which may have been incurred on his account, he shall be forthwith discharged. But if he omit within twenty-four hours after so declaring his dissent to pay such money, he is to be considered as enlisted, as if he had given his assent before the magistrate.

If a recruit, after receiving the enlistment-money, and, after notice of having enlisted has been left at his place of abode, shall abscond, he may be apprehended and punished as a deserter or for being absent without leave; and if it be discovered that he is unfit for active service, in consequence of any infirmity which he had not declared before the magistrate, he may be transferred to any garrison, or veteran or invalid battalion, though he may have enlisted for some particular regiment. If it be proved that the recruit concealed the fact of his being a discharged soldier, he may be sentenced to suffer punishment as a rogue or vagabond; and if, at the time of enlisting, he falsely denied being in the militia, he may be committed to the house of correction for a period not exceeding six months; and, from the day in which his engagement to serve in the militia ends, he is to be deemed a soldier in the regular forces.

An apprentice who shall enlist denying himself to be such is deemed guilty of obtaining money under false pretences; and, after the expiration of his apprenticeship, he is liable to serve in her Majesty's forces; but a master is not entitled to claim an apprentice who may have enlisted unless the claim be made within one month after the apprentice shall have left his service.

In the third clause of the Mutiny Act it is stated that no man enlisted as a soldier is liable to be arrested on account of any process for leaving a wife or child chargeable to a parish, or on account of any engagement to work for an employer (except that of an apprenticeship), or on account of any debt under 30*l.* And in the 57th clause it is declared that Negroes, purchased on account of the crown and serving in any of the regular forces, are deemed to be free, and are considered as soldiers having voluntarily enlisted. Every military officer acting contrary to the provisions of the Mutiny Act, in what regards enlisting recruits, is liable to be cashiered.

During the reign of Queen Anne it was the custom to enlist recruits for three years; but this period seems too short, considering the time unavoidably spent in training the men, to afford the government an advantage adequate to the expense of maintaining them; and the present practice is to enlist either for an unlimited period, as during the continuance of a war, or for certain defined numbers of years which vary in the different classes of troops. For the infantry the period is seven years; for the cavalry ten years, and for the artillery twelve years; but if the person enlisting be under eighteen years of age, the difference between his age and eighteen years is added to each period. The enlistments for the Honourable East India Company's service are also for unlimited periods or for twelve years, provided the recruit be not less than eighteen years of age.

The advantages of a limited period of serving are, that a greater number of recruits are obtained under that condition, probably because men are more willing to engage themselves for a certain number of years than for life; and that, during the period, opportunities are afforded of discovering the character of a man. Should this be such as to render it not advisable to retain him, he may be discharged at the end of his time of service; while an additional bounty, strengthened by the unwillingness of most men to leave the comrades with whom they have been long accustomed to associate, will probably induce a good soldier to re-enlist should the continuance of his services be desired.

By an act passed in 1835 a man is allowed to enlist in the navy for a period not exceeding five years, after which he is entitled to his discharge and to be sent home, if abroad, unless the commanding officer should conceive his departure to be detrimental to the service; such officer is then empowered to detain the man six months longer, or until the emergency shall cease, in which case the man is entitled, during such extra service, to receive an increase of pay amounting to one-fourth of that which he receives according to his rating. At the end of his time of service a seaman may re-enlist for a like period, and he will then be allowed the same bounty as at first. Seamen entering as volunteers within six days after a royal proclamation calling for the services of such men receive double bounty. In the year 1819 was passed that which is called the Foreign Enlistment Act, by which British subjects are forbidden to engage in foreign service without licence from the crown: this is that act which is nearly suspended in favour of the troops now (1837) employed in the service of the queen of Spain. Lastly, a bill has recently passed, confirming the act of 59 Geo. III., by which her majesty is empowered to grant the rank of field and general officers to foreigners; and to allow foreigners to enlist and serve as non-commissioned officers and soldiers in the British service in the proportion of one foreigner for every fifty natural born subjects.

ENNIS, the assize town of the county of Clare in Ireland; situated in the barony of Islands on the west bank of the river Fergus, about three miles above the small town of Clare, at which place this river is navigable. [CLARE.] The direct distance from Dublin is 139 English miles. The borough, as settled under the Boundary Act, embraces 469 statute acres, and comprises 1350 tenements, of which 564 only are slated houses. It is incorporated by charter of the 10th James I., and returns one member to the Imperial Parliament. The corporation, consisting of provost and free burgesses, is virtually extinct.

The name of the place was originally Ennis Cluainruadha, so called from Clonroad, a favourite dwelling-place here of the O'Briens, Lords of Thomond. In 1240 Donogh Carbrac O'Brien built a monastery at Ennis for Franciscan friars, the erection of which probably gave origin to the town. It was repaired in 1305 by Turlogh Mac Tiege, and destroyed in 1306 by Dermot Mac Donogh, both of the same family. The ruins are still standing.

Ennis consists of two chief streets, one parallel to the Fergus, over which are three bridges, and one diverging towards Kilrush. Near the latter are the county gaol and court-house, the only buildings of consequence in the town. The suburbs consist of wretched cabins. There is no police, neither is Ennis watched, lighted, or regularly cleansed. There are no manufactures; but there is a moderate trade in grain and cattle. In 1821 the population of Ennis was 6701, and in 1831 it was 7711; the total population within the boundary of the borough in the latter year was 9727. In the parish of Drumcliffe, in which Ennis is situated, there were, in 1834, 21 schools educating 772 males and 528 females. Of these schools, four were Sunday-schools, seven were hedge-schools, and one was in connection with the National Board of Education. (*Statistical Survey of Clare; Parliamentary Reports and Papers.*)

ENNISCORTHY, a borough town in the baronies of Scarawalsh and Ballaghkeen in the county of Wexford in Ireland; situated about 12 English miles above Wexford on both banks of the river Slaney, which is here navigable for sloops. The direct distance from Dublin is about 57 English miles.

Enniscorthy was incorporated by charter of the 11th James I. The corporation consists of a portreeve and 11 burgesses. The portreeve holds a court once a week with jurisdiction to the amount of 3*l.* 6*s.* 8*d.* late Irish currency. The corporation has no revenue. The boundary is very irregular and extends in some directions two and three miles from the town.

Enniscorthy took its origin as a town from the erection of a castle here by Raymond le Gros, one of the early Anglo-Norman conquerors, about the end of the twelfth century. Gerald de Prendergast, another Anglo-Norman noble, founded a monastery here for Augustinian friars about 1240; and Donnell Cavanagh, an Irish potentate, founded a Franciscan convent for friars of the strict observance in 1460. On the dissolution of religious houses, the possessions of the Augustinians were granted to Edmund Spenser, the poet, and those of the Franciscans to Lord Henry Wallop. Some ruins of both edifices still remain. The castle also is still standing and in good preservation. It consists of a square keep flanked by round towers, and stands at the west end of the bridge, on the bank of the Slaney, opposite the remains of the Franciscan convent. Enniscorthy was taken by Cromwell in 1649, and was stormed and burned by the Irish rebels in 1798. On the latter occasion it is said that 478 dwelling-houses were destroyed. In the immediate neighbourhood is Vinegar-hill, the scene of a sanguinary engagement in the latter year. [WEXFORD.]

Enniscorthy is at present a thriving and handsome town. It has a very considerable trade in grain with Wexford. The population of that part of the town which lies in the barony of Scarewalsh, in 1821, was 3557; and in 1831 was 4375. The population of the entire town as situated in the baronies of Scarewalsh and Ballaghkeen was in the latter year 5955. In 1834 there were in the parishes of St. Mary's, Enniscorthy, and Templeshannon, in which the town is situated, 13 schools educating 499 males and 469 females. Of these schools that attached to the nunnery of Enniscorthy educates 230 females. (Brewer's *Beauties of Ireland;* Inglis's *Ireland in* 1834; *Parliamentary Reports, &c.*)

ENNISKILLEN, the assize town of the county of Fermanagh in Ireland; situated in the baronies of Tyrkennedy and Magheraboy, on an island in the narrow channel which connects the upper and lower lakes of Loch Erne. The direct distance from Dublin is about 87 English miles.

The antient borough comprises the island of Enniskillen, the site of the castle excepted: under the Boundary Act the borough now includes the two suburbs which are situated north-east and south-west of the island, in the parishes of Enniskillen and Rossory respectively.

Prior to the plantation of Ulster, the only building on the island of Enniskillen was a small fortalice of the Maguires, which came into the hands of the English during the last rebellion of Tyrone in 1602. The town was altogether the work of the Protestant settlers introduced by the new patentees. [FERMANAGH.] It was erected into a corporation while still in its infancy in 1612; but had increased so far as to cover the greater part of the island in 1641, when, through the exertion of Sir William Cole, it proved a most important asylum for the Protestants on that border of Ulster. In the subsequent war of the Revolution the inhabitants of Enniskillen were among the first to take decided measures against the government of James II., having refused admission to two companies of the Roman Catholic army sent thither by Tyrconnell, and immediately chose Sir Gustavus Hamilton their governor, and proclaimed William and Mary. Throughout the contest which ensued, the local levies of Enniskillen and its neighbourhood did excellent service; particularly in their defeat of Lord Galmoy, before Crom Castle, and in the battle of Newtown-Butler or Lismaskea, where, under the command of Wolsey, they routed the army of Macarthy advancing to the siege of the town with a slaughter of nearly 3000 Irish. Their exploits have been recorded in Hamilton's 'Actions of the Enniskilleners.'

The corporation consists of a portreeve and 14 free burgesses, but does not exercise any civil or criminal jurisdiction. The annual revenue is 596*l.* 10*s.* 9*d.*, arising chiefly from tolls: the expenditure 595*l.* 2*s.* Enniskillen is not watched or lighted. The principal road through the town is repaired at the expense of the county.

Enniskillen is well built and beautifully situated. Two bridges connect the island, which is covered to the water's edge with the buildings of the town and its defences, with the suburbs on each side. The country around swells into highly cultivated eminences; and numerous seats of gentry occupy the shores of the lake above and below. There is a brisk retail trade in the supply of those comforts required by the superior order of farmers who occupy the neighbouring districts, and everything wears a prosperous and decent appearance, which contrasts very strongly with the wretchedness of other towns lying but a short distance farther south. Three newspapers are published in Enniskillen, which in 1835 used 26,600 stamps. From its position, commanding the only pass into Ulster within a distance of 50 Irish miles, Enniskillen is a place of considerable military importance.

In 1821 the population of Enniskillen was about 4399; and in 1831 the entire town contained 6056 inhabitants, and the borough 6116. In 1834 there were in the parishes of Enniskillen and Rossory 50 schools, educating 1186 males and 728 females. Of these schools three were in connection with the National Board of Education, nine were Sunday-schools, and fifteen were hedge-schools. The royal school of Enniskillen is supported by the estates of the foundation. The head master receives 500*l.* yearly, a house, and 33 acres of land; the assistants receive 350*l.* yearly; and 400*l.* is annually divided among ten scholars of the house; 41 males were receiving instruction here in 1834.

Enniskillen is represented in the Imperial Parliament by one member. (Cox's *History of Ireland;* Leland's *do.*, Inglis's *Ireland in* 1834; *Reports, &c.*)

ENNIUS, QUINTUS, the old epic poet of Rome, was born at Rudiæ, now Ruge, in Calabria, in the year 239 B.C., two years after the termination of the first Punic war. He was a Greek by birth, and is one among many instances how much Roman literature was indebted even directly to foreign talent. History does not inform us what his original Greek name was, for that of Ennius is evidently of Latin form, and was probably adopted by him when he was admitted to the privileges of a Roman citizen. Of his early life little is positively known. He entered the military service of the Romans, and in the year 204 was serving as a centurion in the island of Sardinia, where his abilities attracted the notice of Cato, who was then acting as quæstor under the first Scipio Africanus. When Cato left the island the poet accompanied him to Rome, and fixed his residence on the Aventine hill. The introduction of Cato, his military character, and his poetical abilities, won for him the friendship and intimacy of the first men of Rome, and he was largely instrumental in introducing letters among a nobility who had hitherto gloried as much in their ignorance as their courage. Cato himself learned Greek from him. Scipio Africanus found in him a companion in peace and the herald of his glories in war. Scipio Nasica, the son of Africanus, delighted in his society; and M. Fulvius Nobilior, the consul, 189 B.C., himself possessing a high literary character, prevailed on the soldier-poet to accompany him in the war against the Ætolians. It was to the son of this Fulvius that he was indebted for his admission to the citizenship of Rome. His great social qualities unfortunately led him into intemperance, for which he paid the penalty in great sufferings from gout. Still a hardy constitution enabled him to complete his seventieth year, and to the very last to devote himself to his favourite muses. He died in the year 169, and was buried in the Cornelian sepulchre, one mile out of Rome, on the Appian road, where his statue still appeared with those of Publius and Lucius Scipio, even in the age of Livy, a lasting monument of his intimacy with those great men. He lived, as we have already said, in the splendid dawn of Roman literature. Nævius, the first poet of Rome, and Livius Andronicus were his predecessors by not many years. The tragic poet Pacuvius was his sister's son. Plautus was his contemporary, and the comic writer Cæcilius his companion in arms. The writings of Ennius were numerous and various. His great work called, somewhat unpoetically, by the name of Annals was an historical epic in eighteen books, written in hexameter verse, a form of metre which he is said to have been the first to introduce into Roman literature. This work traced the history of Rome from the mythical age of Æneas down to his own time. His labours in tragedy were extensive. He gave the Romans a translation, but evidently a very free one, of the Eumenides of Æschylus, the Medea, Iphigenia in Aulis, and Hecuba of Euripides, the Ajax Flagellifer of Sophocles, besides as many as nineteen from other Greek poets. He also wrote comedies. His other works were Phagetica, a poem on gastronomy, especially on the merits of fishes; an epic, or panegyric, entitled Scipio; a metrical translation from a philosophic work of Epicharmus, partly in dactylic hexameters, partly in trochaic tetrameters; poems entitled Asotus, Sotadicus, Protreptica, and Præcepta; also satires, epigrams, and acrostics; and a prose translation of the sacred history of Euemerus. Of all these works there is only an unconnected mass of fragments collected from quotations in Cicero and other writers. The work entitled Annals was for a long time the national epic of Roman literature, and Virgil has not scrupled to borrow freely from it. The best edition of Ennius is that by Hesselius, 4to. Amsterdam, 1707.

ENNUI, a French word adopted of late into the English language, signifies mental lassitude or languor, produced either by depression of spirits or satiety of enjoyment or over excitement, and which leaves no relish for any mental pursuits or pleasures. 'Mourir d'ennui' is a French phrase which means that the mind sinks under this kind of depression, without any apparent cause of either misfortune or grief. Persons in the upper ranks of society who have pursued a life of dissipation, or who have lived much in what is called the fashionable world, are often subject to this complaint. Madame du Deffand used to complain bitterly of ennui. Ennui in French means care, or disappointment in general; and a tiresome person is often called *ennuyeux* or *ennuyant*. The word '*noja*' in Italian answers to the French *ennui*.

ENOCH, the Book of, is one of the Hebrew Scriptures which, with the book of Wisdom, of Tobit, Judith, Maccabees, and several others, were designated Apocryphal, that is, hidden books (Βίβλοι Ἀπόκρυφοι) from the fact that after the destruction of the temple at Jerusalem by the Romans, the Jews having established at Tiberias their sacred archives, called by the Greek Fathers Gazophylakia (Γαζοφυλάκια), they there concealed in a vault, under the seal of their patriarch, such books as it was considered expedient to withdraw from public inspection. (Epiphanius, *Hæres.* 30, § 6 and 4.) The Scriptures deemed canonical were here deposited in a new ark, called the Aron (Ἀρών), or ark of the Covenant ([illegible]), but the holy books ([illegible]), which were not included in this chest, and which, about the close of the first century, were suppressed by the Jews, and thus concealed, were thence called the Apocrypha (Ἀπόκρυφα). It is stated that the use which was made of some of these scriptures by the zealous advocates of Christianity occasioned an anxiety among the Jews to hide them, and that the predictions of the Messiah in the book of Enoch were considered to be so obvious that it was on this account concealed. (See on this point Pezron, 'L'Antiquité des Tems défendue,' 4to, p. 470.) During the apostolic age the book of Enoch was commonly read by Jews and Christians. St. Jude, in his catholic epistle, cites it as the work of a divine prophet ('Enoch the seventh from Adam prophesied, saying,' &c., v. 14, 15,) as Tertullian (*De Idololatria*) refers it to the inspiration of the Holy Spirit: however, in another treatise (*De Cultu Fœminarum*) he states that by some it was not received. Irenæus, Jerome, and other Fathers, respectfully notice it, though not as canonical; and Origen (*contra Celsum*, lib. v.) observes that, in his time, it was not of great authority in the churches, which Pezron attributes to the fact mentioned by Syncellus (*Chronographia*), that it was maliciously corrupted by the Jews and Christian heretics. Whiston published in 1727 a learned Dissertation to prove it to be quite as canonical as any book to which that epithet is applied. In the Testament of the Twelve Patriarchs, translated by Robert Grosthead, bishop of Lincoln, the sons of Jacob speak often of reading in the book of Enoch. It was extant among Christian writers until the eighth century, when it appears to have been lost. Several fragments however remained, which, with a few citations collected from the Fathers and succeeding writers, supplied the only data for the critical discussions of learned divines during several centuries. All these relics, amounting to about 20, are inserted in the 'Codex Pseudepigraphus Vet. Test.' of Fabricius, tom. i. p. 160—224.

At the end of the 18th century Bruce brought from Abyssinia three complete and beautiful copies of the book of Enoch, in the Ethiopic language, one of which he presented to the Bibliothèque du Roi at Paris, and another to the Bodleian Library at Oxford. Transcriptions and partial translations into Latin were made by Dr. Woide of Oxford and Dr. Gesenius of Halle; but the Ethiopic MS., which at first excited much curiosity, lay unnoticed during more than a quarter of a century, until the professor of Hebrew at Oxford, Dr. Laurence, broke in, as he informs us, upon its repose, and published in 1821 an English version of the whole, entitled 'The Book of Enoch the Prophet, supposed for ages to be lost; translated from an Ethiopic MS. by the Rev. Richard Laurence, LL.D., archbishop of Cashel.' A second and revised edition appeared in 1833. That this book is identical with that which, in the primitive ages of Christianity, was cited by Jude and the Fathers, is considered by Dr. Laurence to be completely evident. His critical prolegomena and notes are incorporated in a more recent translation into German, which is accompanied with a much larger mass of learned researches, forming two thick volumes 8vo. ('Das Buch Henoch, in vollständiger Uebersetzung mit fortlaufendem Commentar, ausführlicher Einleitung und erläuternden Excursen, von Andreas Gottlieb Hoffmann, Doct. Philos. Profess. Theol. an der Universit. zu Jena,' 1833.) As the allegorical statements of the book, so far as any meaning is clearly assignable, appear to relate to historical events which extend to the time of Herod the Great, it is supposed by those who reject the supposition of its being the antediluvian production of Enoch himself that it was anonymously written in Hebrew, shortly before the commencement of the Christian era. (Scaliger and Laurence.) The subject matter consists chiefly of relations of Enoch's prophetical and celestial visions, in the most remarkable of which the angel Uriel (lxx. et seq.) shows to the prophet all the mysterious sources in heaven, including a survey and explanation of the solar and lunar revolutions according to the antient astrological theory. A view is also exhibited of the interior of hell. Occasionally religious and moral precepts are enjoined, but all sense of propriety is continually shocked with such preposterous combinations that Scaliger, judging merely from the fragments then possessed, scrupled not to designate the book as a tissue of disgusting lies and nonsense ([illegible]). It commences with some historical statements of which the following, from chap. 7, is a specimen:—'To the sons of men were born elegant and beautiful daughters, and when the angels, the sons of heaven, beheld them, they became enamoured of them, saying to each other, Come, let us select wives for ourselves and beget children.' Accordingly a band of 200 angels having descended on Mount Armon, and sworn to accomplish this project, 'they then took wives, each choosing for himself; with whom they cohabited, teaching them sorcery and incantations; and the women conceiving, brought forth giants whose stature was each three hundred cubits (450 feet): these, when they had devoured all the produce of man's labour, began to devour men, birds, beasts, and fishes, eating their flesh and drinking their blood.' In representing persons and events by animals and inanimate objects of nature, combinations are introduced of such a monstrous nature, that, in comparison, the metamorphoses of the Pagan mythologies appear to be rational. The history of the prophet to whom this book is attributed, or rather whose visions it relates, is briefly recounted as follows, in Genesis v. 18—24:—Jared at the age of 162 begat Enoch, who at the age of 65 begat Methuselah, and afterwards walked with God 300 years, and begat sons and daughters. All the days of Enoch were 365 years; he walked with God, and was not, for God took him. (Compare Ecclesiasticus xliv. 16; Heb. xi. 5.) From the fact of his being the seventh from Adam, from the number of the years of his age being precisely the number of days in the year, and from several other points of curious coincidence, the sceptical Boulanger asserts, in a learned treatise on the subject (Enoch, in Œuvres Diverses), that the name is but a variation of the Phrygian Annac, a symbolical personification in Sabism, representing the solar period; and identical with the Oriental Anach, the Phœnician Anac or Enac, the Etruscan Anus, and the Latin Janus. The names of the seven patriarchs, Adam, Seth, Enos, Cainan, Mahalaleel, Jared, and Enoch, are etymologically resolved into mythical symbols of the seven planets, that is, the Sun, Moon, Mars, Mercury, Jove, Venus, and Saturn. The translation of Enoch has also been compared with the antient mysterious burial at sunrise of noble and comely youths who prematurely died. (Eustathius, *Comment. in Odyss.*, tom. iii, p. 1527, § 51, ed. Rom., 1549.) They were said to have been not really dead, but carried up alive to the region of light in consequence of their being loved by the Supreme Being. The story of Ganymede is an instance. (See the learned disquisition on the subject in Montfaucon's *Religion des Gaulois*, tom. ii. p. 305, &c., and in his *Explication des Textes difficiles*, tom. i. p. 337.) Hence the well-known axiom, 'He whom the Gods love dies young.' (Plutarch, *De Consolatione Philosoph.*)

ENROLMENT, in law, is the registering, recording, or entering a deed, judgment, recognizance, acknowledgment, &c., in the Chancery, or any other of the superior or inferior courts being a court of record. But the enrolling of a deed does not make it a record, though it thereby becomes a deed recorded; for there is a difference between a matter of record and a thing recorded to be kept in memory; a record being the entry of judicial proceedings in a court of record; whereas an enrolment of a deed is the private act of the parties concerned, of which the court takes no judicial notice. Various statutes have directed instruments to be enrolled, as the 27th Henry VIII. c. 16, relating to deeds of bargain and sale of freehold lands; and the 53rd George III. c. 141, relating to memorials of annuities, &c. All deeds also relating to property in the counties of York and Middlesex are registered in the register-offices there established by statute. Wills affecting lands should, by the direction of the statutes, be registered both in Middlesex and Yorkshire, and also at Kingston-upon-Hull. A bill to establish a general register has several times within the last five years been introduced into parliament, but hitherto without success, owing chiefly to the opposition of the landed interest.

ENS (river). [AUSTRIA, p. 136.]

ENS, the PROVINCES of the, constitute the archduchy of Austria, which, with Styria, Carinthia, Carniola, Görz, Trieste, part of Istria, the Tyrol, and Vorarlberg, form what are denominated the hereditary dominions of the house of Austria. The archduchy is divided into the two provinces of the Lower and Upper Ens, commonly called Lower and Upper Austria, has altogether an area of about 14,881 English square miles, and about 2,147,000 inhabitants (in 1827, 2,075,335), and contains 52 towns and 12,143 market and other villages. Lower Austria is the most antient possession of the house of Austria, and was acquired by conquest from the Avari in the year 796. Charlemagne, who subjected it, formed it into a margraviate; it became a Bavarian fief, and so continued until Count Leopold of Babenberg was recognised as its independent possessor in 944. It continued in the possession of the princes of Babenberg, who added Upper Austria to it, and raised the whole into a duchy, until Ottokar, king of Bohemia, expelled them in the middle of the thirteenth century. In 1276, however, Rudolph of Habsburg wrested the duchy out of his hands, and his descendants have remained in possession of it to the present day. They assumed the title of archdukes in 1359, but were not recognized as such until the year 1453.

The province of the LOWER ENS, or LOWER AUSTRIA, lies nearly in the centre of the Austrian dominions, on both sides of the Danube, between 47° 26′ and 49° 0′ N. lat., and 14° 26′ and 17° 1′ E. long. It is the eastern portion of the archduchy, and its boundaries are, on the north, Bohemia and Moravia; the east, Hungary; the south, Styria; and the west, Upper Austria. According to the new admeasurement made by the quarter-master-general's department, the area of this province, which is very little less than Wales, is 7251 English square miles, of which 3651 are on the northern, and 3600 on the southern bank of the Danube. The subdivisions are as under:—

	Subdivisions.	sq. m.	Population.	Chief Towns.		
	Vienna Township	57	345,000			53 towns, 239 market villages, and 4396 villages.
South	Circle of the Lower Wienerwald	3,542	190,000	Traiskirchen	1,000	
	Ditto Upper ditto		232,000	St. Pölten	4,400	
North	Ditto Lower Mannhartsberg	3,652	275,000	Korneuburg	1,900	
	Ditto Upper ditto		238,000	Krems	8,800	
		7,251	1,280,000			

The Lower Ens is walled in both on the north and south by ranges of mountains. A branch of the Noric Alps, of limestone formation, not only occupies its southern districts, but spreads its branches over the whole country south of the Danube, with the exception of the most eastern parts. Its most elevated points are the Schneeberg, in the south-west of the Lower Wienerwald, which has two peaks, the Alpengipfel (Alpine peak), 7383 feet, and the Grosser Riese (great giant), 7331 feet high; the Goeller, 6327 feet, in the southern extremity of the same circle, and the Wecksel, in the same quarter, 6203 feet. A series of wooded heights, denominated the Wiener Wald (Vienna Forest), separate the Upper from the Lower Circles of the Wienerwald, and run from south-west to north-east. On the left bank of the Danube, and throughout the western and nearly the whole of the eastern districts of the northerly portion of the Lower Ens, the Bohemian and Moravian chains of the great Sudetsh range extend their last offsets in all directions until they subside in the valley of the Danube. A succession of these heights, called the Mannhart group, and running from north to south, divide the Upper from the Lower Mannhart circles, and give their name to them. The most elevated point in this quarter is the Yauerling, close to that river, in the south of the Upper Mannhartsberg circle, which is 3330 feet high. In the northern and eastern parts of the Lower Mannhartsberg circle the ranges of hills are of inferior height. The Cetian mountains on the right bank of the Danube are connected with the Noric Alps. Many of these chains are densely wooded; others are entirely naked. The most extensive forests are the Wiener (Vienna), Ernstbrunn, Hochleiten, and Mannhart; the line of the first of these divides the Lower from the Upper Wienerwald circle. It is estimated that the area occupied by the mountains of the Lower Ens is at least one-third of its whole surface: they are furrowed by numberless valleys, which give the province a beautifully varied and picturesque appearance.

The fine valley of the Danube spreads out on both banks of the river in a continuous level from Korneuburg as far as Krems, and the greater part of the streams which water the Lower Ens discharge themselves into that river. The Danube itself traverses the province from west to east for about 156 miles, entering it a little to the north-east of Neustädtel, and quitting it between Hainburg and Theben, which latter town is within the Hungarian borders. Between those towns it has a fall of more than 510 feet (450 Vienna feet), and its current is accordingly so rapid that it flows beneath St. Sophia's bridge, in Vienna, at the rate of [illegible] feet per second. Its breadth across the island of Lobau, [illegible] to Vienna, is 3050 Vienna fathoms (18,986 English feet), but in some parts, particularly below Marbach and at T[illegible]lern below Krems, its channel is so narrowed by the islands that it rushes forwards with a violence which in former times, rendered the navigation extremely perilous. The tributaries of the Danube, so far as the Lower Ens is concerned, are of no great length or volume of water. On the right bank are the Ens, Ips, Erlaf, Billach, Trasen or Traisen, Schwechat, great Fischa, and Leitha: all these streams flow down from the Alpine mountains in the southerly districts of the Lower Ens, and are remarkable for the green colour of their waters; the great Fischa has also the peculiar characteristics of seldom varying in the body of its water and never freezing. The Danube, on its left bank, receives the Krems, which irrigates the south of the Upper Mannhartsberg circle, flowing through the beautiful valley of the Krems, antiently called the 'Vallis Aurea,' or Golden Valley, and falling into the Danube at Krems; the March, which, next to the Danube, is the largest river in the Lower Ens, and which, entering the province from Moravia, forms its boundary on the side of Hungary for about 48 miles, and is navigable to its mouth, where its breadth is about [illegible] feet; and the Kamp. The only streams which are not tributary to the Danube are some rivulets which, like the [illegible] and the Mürz, flow down from the Alpine heights in the south of the province, and join the Mürz; and the Lainsitz in the north-west, where it takes the name of the Braunau at Gmünd and of the Schwarzbach at Schwarzbach, under which designation it ultimately falls into the Moldau, a tributary of the Elbe.

Independently of the Donau-canal (canal of the Danube), near Vienna, which is merely an enlarged arm of the Danube, the only canal in the Lower Ens is the Vienna or Neustadt canal, which opens out from the preceding and terminates at Wiener-Neustadt, about 34 miles south of the capital. The original plan was to carry this canal to the Adriatic, and thus connect the Danube with that sea

There are some large natural sheets of water, but none deserving of the name of lakes: the largest is the Erlaf or Zellersee, which is about 4998 feet long, 1890 broad, and from 620 to 630 deep. Near the Mittersee there is a beautiful waterfall 200 feet high, and close to it is a spot called the Brüllender Stier (roaring bull), whence the roar of a subterraneous cascade is heard.

Among the mineral waters of the Lower Ens none are of such repute as those of Baden, in the Lower Wienerwald, about 19 miles south-west of Vienna, or 15 in a straight line. (Vol. iii., p. 261.) The waters of Medling (first discovered in 1805), Deutschaltenburg, Heiligenstall, Dobling, &c., are also used.

The varied character of the surface occasions considerable difference of climate. The mountainous nature of the north-western and southern parts of the province renders the temperature colder than it is in the low lands about the Danube and in the eastern districts. There is no mountain which attains the limit of perpetual snow, which would in this latitude be found at an elevation of about 9400 feet. By observation at the Vienna observatory, which stands at a height of 570 feet above the level of the sea, it has been ascertained that the average annual temperature in Vienna is about 51° Fahr.: in 1824 it rose to 52° 44′; the summer heat is between 77° and 83°, and the maximum heat does not exceed 97°; the winter cold varies between 10° and [illegible] below the freezing point, and has never been greater than 22°. The weather is very variable, and on the lofty summit of the Schneeberg it changes, says Blumenbach, almost every hour. About Annaberg, in the south of the Lower Wienerwald, the country is so desolate that it goes by the name of the Siberia of Austria.

The soil of the Lower Ens differs much in productiveness. The richest tracts are in the centre of the province, from the confluence of the Ens eastwards as far as the Polenfeld on the right bank of the Danube; and on the left bank, from Krems they extend until they spread over the south-eastern parts of the Upper Mannhartsberg to the efflux of the March into the Danube. The lands about the lower March, indeed, which are called the Marchfeld, are a Delta, which, under efficient cultivation, might become the granary of the Austrian metropolis. There is an extensive level also in the vicinity of Vienna, which, in parts, is extremely fertile. On the whole, the Lower Ens does not rank among the more productive provinces of the empire. It is a manufacturing rather than an agricultural province.

The inhabitants of this province, as well as those of the other division of the Archduchy of Austria, are of German descent. After the Avari were driven out, it was re-peopled by Bavarians, Swabians, Saxons, and Franconians, principally indeed by the first mentioned; a circumstance which accounts for the similarity in language and manners between the native Austrian and his Bavarian neighbour. The majority is of the Roman Catholic persuasion, and the minority, Protestants, Greeks, and Jews, with a few Armenians. In 1800, the number of native born inhabitants was 1,016,312, besides about 39,020 settlers from the other parts of Austria and foreign parts. In 1808 it was 1,058,440; 1810, 1,072,294; and in 1825, 1,152,595, besides about 40,000 persons not born in the province; the present population is about 1,230,000. The proportion of males to females is as about 56 to 55. The number of houses in 1810 was 137,380; in 1827, 153,169; and it is at present about 156,500. In the eastern and north-eastern districts there are many Sclavonians, here denominated Croats. In 1828 the births amounted to 47,366, and in 1831 to 46,789; while the deaths amounted in 1828 to 44,520, and in 1831 to 49,663. In 1830 the marriages were 12,604.

Nearly one half of the province is devoted to the production of grain, vegetables, and wine; and of this about 1,909,000 acres are under the plough: yet, in spite of good husbandry, the soil and climate are so little favourable to the growth of corn, that wheat and rye do not yield more than five, barley not more than eight or nine, and oats not more than six or seven grains for each grain sown. The province, in fact, does not produce corn enough for its own consumption. The quantity of meadow-land is estimated at about 550,000 acres; the pastures at about 242,000; and the woods and forests occupy about 1,923,000. Peas and beans and potatoes are universally cultivated, particularly in Upper Mannhartsberg. Vegetables are abundant, and fruit likewise. Hemp and flax are cultivated, but the quality is indifferent and not equal to the demand. Saffron of very superior kind is raised near St. Pölten and Melk. The vineyards occupy about 112,240 acres of ground, and on an average yield 2,000,000 aulms (about 31,000,000 gallons) annually. The finest vineyards are those of Weidling, Klosterneuburg, Grinzing, and some others in the Lower Wienerwald; and the wines of Burgundy and Champagne have long been acclimatised in some parts. The mountain districts produce a very full-bodied durable wine. The woods and forests, which supply both fuel and timber, have suffered so much from neglect that they do not suffice for the consumption of the country. The most extensive, which lie in the circles of the Wienerwald, are chiefly composed of the beech, oak, maple, linden, elm, alder, pine, and fir.

The rearing of horned cattle has never recovered from the blow which it received during the repeated invasions of the French armies. The whole stock does not exceed 200,000 heads. A portion of it is of a very superior native breed. Although the establishments for breeding horses belonging to the crown and several noblemen have done something towards improving the race, this branch of economy is not pursued with much activity. Some writers do not estimate the stock at more than 57,000 or 60,000. Independently of several extensive sheepwalks in many of the upland districts, every peasant feeds his little flock of 10, 20, or 30 sheep. Upwards of one half of the whole stock, estimated at 450,000, are of breeds improved by crossing with merinos and other foreign races. The largest flocks are those on the imperial estates. The yearly weight of wool obtained is about 1,100,000 lbs., and much of it is exported. Goats and swine are not bred in great numbers. Poultry is fed on a large scale for the Vienna market. Some honey and wax are made; the stock of game is much diminished.

The mines of the Lower Ens are not of any great importance. The Annaberg no longer yields silver. There are iron mines at Reichenau, Pitten, Schottwien, Erdweis, Weitra, and other spots, but the quantity raised is but inconsiderable. There are numerous quarries of marble and freestone, &c., particularly in the south; gypsum and calcareous rocks, from which much lime is made, are abundant; mill stones, granite, slate, alum, potter's clay, quartz for making glass and china, and porphyry, are among the other mineral products. Coals are raised in the south and in some other parts.

The Lower Ens ranks next to Bohemia in a manufacturing point of view; and the principal seats of industry are the districts south of the Danube, the northern being chiefly agricultural. In 1811, the number of individuals employed in these districts was 164,171, about one-sixth of the then population of the whole province. *Flax* and hemp yarns are spun wherever the materials are grown; in the Upper Mannhartsberg 3609 hands are employed, besides those who spin for their domestic wants. Cotton wool is also spun in the same circle by hand, and employs between 5000 and 6000 persons. In 1828 the province had 30 factories, in which 224,510 spindles were at work. Much linen is woven, but mostly for home use; and the linen-tape manufacturers of Sieghartz occupy above 1000 hands. Cottons, particularly of the finer sorts, are manufactured on an extensive scale at Vienna; large printing-works are carried on at Neunkirchen, Friedau, St. Pölten, Kettenhof, &c. Cotton embroidery, stockings, &c., are made at Vienna and elsewhere. The woollen manufacture has never prospered to any great extent, although there are some large factories in Vienna, at Rittersdorf, &c., but the silk manufacture has risen to great perfection in the capital, where, even as far back as 1827, it employed above 8000 looms: it is brisk also at Leobersdorf, Neustadt, Katzeldorf, &c. Lace, ironware, and cutlery; tools, copperware, brasswork, buttons, jewellery, and trinkets; articles of wood, leather, glass, mirrors, porcelain, earthenware, paper, musical instruments, soap, &c., form so many additional branches of industry.

The Lower Ens has a considerable trade with the neighbouring countries and foreign parts, by means of its communications by land with the Adriatic, Germany, Poland, &c., and by the Danube with Hungary, Turkey, and the East.

The various scientific institutions and schools, both in Vienna and the several towns in general, afford advantages to this province which must at all times promote its prosperity.

Among the towns not before mentioned are, in the Lower Wienerwald, Hainburg on the Danube 2800, Bruck on the Leitha 2690, Neustadt 10,502, Klosterneuburg on the Danube 2350, Schwechat 2100, Baden 4000, and Mödling 2050; in the Upper Wienerwald, Bairisch-Waidhofen 2100, Tuln on the Danube 1500, Ips at the confluence of the Ips and Danube 1100, and Melk on the Danube 1020; in the Lower Mannhartsberg, Maissau 700, Retz 2200, Laab on the Thaya 1250, Feldsberg 2600, Zistersdorf 1700, Stockerau 1530, and Mistelbach 2850; and in the Upper Mannhartsberg, Stein on the Danube 1700, Egenburg 2000, Weitra 1800, and Langenlois 2150.

The province of the UPPER ENS, or UPPER AUSTRIA, forms the western part of the Archduchy, and is situated on both banks of the Danube, but chiefly on the south, between 46° 57′ and 48° 46′ N. lat. It comprehends the duchy of Salzburg, which was incorporated with it in the year 1816. Its boundaries are, on the north, Bohemia; on the east the Lower Ens or Lower Austria; on the south Styria, Carinthia, and the Tyrol; and on the west Bavaria. Its area, according to the estimate of the quartermaster-general's survey, is 7630 English square miles, or about 305 more than that of Wales. The three eastern circles, the Mühl, Traun, and Hausruck, are called Old Austria; and the new circle of the Inn and Salzburg or Salzach, is termed New Austria.

Sub-divisions, &c.

Circles.	Sq. Miles.	Pop.	Chief Towns.		Towns.	Market Vill.	Vill. & Ham.
Mühl	1183	200,000	Linz	23,800	39	110	7489
Hausruck	777	174,000	Wels	4600			
Traun	1383	190,000	Steyer	10,100	1828.	728,770	inhabit.
*Salzach	2848	140,000	Salzburg	13,000	1836.	736,907	inhabit.
	7630	687,000					

* Comprehends the Duchy of Salzburg.

The Upper Ens is a mountainous country: the parts south of the Danube contain the most elevated alpine regions in the Austrian dominions, and those north of it are intersected by lower ranges which are offsets of the great Bohemian forest range. The Rhætian Alps occupy a small portion of the south-west, and terminate at the Dreiherrenspitz, from which point the Noric Alps occupy the whole of the southern circles of Salzburg, Hausruck, and Traun. The highest summits in this part are the Grossglockner, 12,221 English feet above the level of the sea, on the most southern part of the Salzburg circle; the Ankogel, 11,798 feet; the Grosse Wiesbach or Krummhorn, about 11,770; the Hochkar, 11,270; and the Murauerkopf, 10,070 feet. All these are situated in the southern part of the Salzach circle. There are many wide and numerous small valleys, especially the noble valleys of the Salzach, Gastein, Saal, &c., among the mountain masses that overspread the land south of the Danube, which constitutes five-sixths of the whole surface of the Upper Ens. The only level country in the province is the immediate borders of the Danube. In the Mühl circle, which is north of the river, the most elevated point is the Plöckenstein, close to the common boundary of Bavaria, Bohemia, and the Upper Ens; its height does not exceed 2177 English feet.

Among the numerous streams of the Upper Ens there are five navigable rivers: the Danube, which enters the province in the north-west, below Passau, and quits it after receiving the Ens at the south-eastern corner of the circle of the Mühl; the Inn, which forms the western frontier for a short distance, and receives the Saal, another navigable river that divides the Upper Ens in part from Bavaria; the Ens; and the Traun, which last stream flows out of a small lake not far from Aussee, in Upper Styria, then crosses into the circle of the Traun, at its south-western end, turning from the west to the north, passes through the Lakes Halstätt and Traun, takes a north-easterly direction along the western side of the circle, throws itself over a precipice 60 feet high near Lambach, washes the eastern side of the town of Wels, in the Hausruck circle, and ultimately falls into the Danube, opposite Steyeregg, after a course of about 70 miles. It is navigable after quitting the Traunsee, and the obstruction from the fall at Lambach has been obviated by a side canal 1020 feet in length. Among the minor streams are—the Ayer, which unites the Mond and Kammer lakes, and joins the Danube near the Zizelau, the Salzach or Salza, which waters the south of the circle of that name, then flows through it in a north-westerly direction past Salzburg, and falls into the Inn a few miles south-west of Braunau, the Saal and Lammer, tributaries of the Salzach, and the Rana.

The Upper Ens abounds in lakes, of which the following are the largest. The Traun or Gmunder See, in the west of the Traun circle, 6310 Vienna fathoms long (39,437 English feet), 1570 fathoms (9812 feet) in its greatest breadth, and 598 Vienna feet (620 feet) in its greatest depth. The Halstätter See at the south-western extremity of the same circle, inclosed between high mountains, 4260 Vienna fathoms (26,622 feet) long, 1130 fathoms (7062 feet) broad, and 600 Vienna feet (622 feet) in its greatest depth. The Atter or Kammer See, in the south of the Hausruck circle, 10,300 fathoms (64,375 feet) long and 1745 (10,906 feet) broad; and the Matt or Mond See (Lake of the Moon, from its crescent-like shape), which lies west of the southern end of the Atter See, and is 5600 fathoms (35,000 feet) long and 1070 (6687 feet) broad. There is an immense number of smaller lakes, of which, in the Traun circle alone, 27 have been counted. Swamps and morasses of considerable extent occur in many parts, particularly near the Mond and Traun lakes, and in the Pinzgau, near the banks of the Salzach, in the south-west of the circle of Salzach.

The most celebrated mineral springs of the Upper Ens are those of Gastein, which lie deeply embosomed in the valley of that name among the most southern mountains of Salzach in 47° 5′ N lat. and 13° 8′ E. long. The waters are of a sulphurous nature, perfectly pure and translucid, and the six springs vary from 95° to 112° of Fahrenheit in temperature. The cold mineral waters of St. Wolfgang are also in much repute.

The climate of the Upper Ens is much colder than that of the Lower Ens, though it lies in the same latitude; and much more so in the south than in the north. The warmest parts are in the valley of the Danube. On the whole it is not insalubrious, although not so healthy as the adjacent provinces. The annual mortality is one in thirty-four.

Many extensive tracts, particularly among the alpine masses of the south, are extremely steril. The valleys north of the Tauern group in the Salzach circle abound in clay, limestone, slate, quartz, &c. The low lands of that circle, the northern parts of the Traun, and several districts in the Hausruck, and the western tracks along the Inn, are highly fertile.

The Upper Ens is not rich in native products. Marble however of peculiarly fine quality is found in the Salzach circle, where black, red, blue, and parti-coloured kinds are obtained. In the same circle are found alabaster, crystal, gypsum, garnets, beryls, topazes, emeralds, &c. Granite and sandstone occur generally. There was formerly a much larger produce of metals in the western parts of the province: gold and silver are however still found on the Gastein range at Kauris and Schellgaden, and gold dust in the Salzach and other streams; copper abounds on the Gerlos and in the valleys of Brunn, Stubach, Leogar and Ramingstein, in the two last of which much lead is got; a plentiful supply of iron is procured from the mountains about Hüttau and Flachaw, the Hinteralp and Bundschuh, &c., as well as in the Traun circle, where copper and lead are also obtained. Salt abounds in the hills of Ischil and Hallstätt, and in the Thunburg near Hallein, and the yearly produce is about 55,000 tons. Cobalt is found at Zinkwand. Coals are dug in several quarters; sulphur at Mühlbach and Grossarl in the Salzach; and there are extensive peat-mosses.

The Upper Ens contained 755,891 inhabitants in the year 1815; 826,575 in the year 1825; and the present number is estimated to be 867,000. The births in 18[illegible] were 24,460, and in 1831, 24,035: the deaths in 1828 were 22,1[illegible], and in 1831, 21,080: and the marriages in 1829 were 5[illegible]. The majority of the inhabitants are of the same stock as the Bavarians. On the banks of the Ens and Traun are some villages peopled with individuals of Sclavonian extraction. The proportions throughout the province are said to be five agricultural labourers to two operatives, one of noble blood in every 438 persons, and one ecclesiastic in every 260. The Roman Catholic is the predominant religion, and there are not above 30,000 protestants in the whole province. The average issue of each marriage is estimated at from four to five children.

Agriculture is said to be in a more advanced state in the Upper than in the Lower Ens. The quantity of land under the plough is estimated at 1,162,510 acres: wheat, barley, oats, and rye are the chief crops; and agriculture is conducted on the largest scale in the circles of the Mühl, Hausruck, and Traun. About 35,600 acres are occupied as garden-ground; about 115 only for vineyards in the Mühl and Hausruck; about 510,600 as meadows; and 1,1[illegible] are used for grazing cattle. It is calculated that 1,346,[illegible] are covered with woods and forests. Very considerable quantities of potatoes and fruit are raised in the Upper Ens. In some parts the produce of grain is so small, for instance in the Viechtau on Lake Traun, that in the best years it does not yield above three grains for every grain sown; in the northern parts of the Traun, on the contrary, wheat produces eightfold, and oats tenfold and upwards. The quantity of grain raised is about 1,480,000 quarters annually.

The province abounds in pastures and the rearing of cattle is general. The race of horses bred in the Pinzgau, a district among the Alps north of the Salza, is reputed to be the largest and tallest in Europe: they are generally 19 hands high. In 1830 the stock of horses of all kinds in the Upper Ens was 46,950. The horned cattle are of a large breed: the stock in 1830 was 85,3[illegible]9 oxen and 293,604 cows. The sheep are of an inferior race, and none of them yield fine wool: the stock in 1830 was 199,925, a diminution of 15,498 since 1827. Goats abound in the upland parts. The lynx, wolf, and bear are occasionally met with; foxes, stags, deer, marmots, polecats, squirrels, martens, hares, and wildfowl are more or less plentiful. Fresh water fish are abundant: and the beaver and otter are at times seen on the banks of the Danube, Mühl, and Aschach. The pearl muscle is found in some of the rivulets in the upper part of the Mühl circle.

The manufactures of this province, though less extensive than those of the Lower Ens, are considerable. The peasantry in general manufacture their own linens and woollens, and make what leather articles they require. Much linen thread is spun as well as woollen and cotton yarn, on which above 14,000 hands are employed in the Mühl circle alone, where there are upwards of 5000 looms for weaving linens, &c., and numerous factories where linens and cottons are printed. The manufacture of cotton cloths is most extensive at Schwanenstadt in the Hausruck, Lintz, Urfahr in the Mühl, Wels, Steyer, and Gallen. There is a considerable manufactory of woollens and carpets belonging to the crown, in Lintz; and others in Wels, Leonfelden in the Mühl, Neuhof, &c. About St. Wolfgang in the Traun cloth of goats' hair is prepared. Large quantities of steel and ironwire tools, &c., are made in the Upper Ens, particularly in Steyer and the districts to the south of it, at Steinbach, Sierning, Neuzeug: Steyer, in fact, has been called the Birmingham of Austria; but its manufactures are of coarser workmanship. There are copper and brass works at Ebenau in the Salzach, Reichraming, and near Wels. The preparation of wood for domestic and other purposes gives considerable employment to all the parts south of the Danube. Bleaching-grounds and tanneries are numerous. Paper, glass, leather, earthenware, chemicals, beer, and spirits are manufactured pretty extensively.

The exports of the Upper Ens are very considerable, and consist principally of salt, timber, and wood for fuel, yarns, linens, woollens, carpets, ironware, tools, nails, and screws, cutlery, flax, cotton-yarn, cottons, stockings, cheese, beer, cattle, earthenware, mill and polishing stones, stone for building, marble, and fruit.

The principal towns, independently of the chief towns in the several circles, are, in the Mühl circle, Freistadt on the Feldaist, 2200 inhabitants; Urfahr, or Ufer-Lintz, united by a bridge to Lintz, 2600; and Steyeregg on the Danube, 880: in the Hausruck circle, the towns of Efferding, 1000; Schwanenstadt; and Grieskirchen: in the Traun circle, Ens, on a steep hill on the left bank of the Ens, with five suburbs, 380 houses and 3000 inhabitants; Gmunden, at the efflux of the Traun from Lake Traun, 1250 feet above the level of the sea, with six suburbs, 440 houses and 3230 inhabitants, with saline springs and baths; Kremsmünster, built round a hill on the left bank of the Krems, with several public schools, a rich abbey, an observatory, and collections in natural history, &c., and 950 inhabitants; Kirchdorf, St. Florian, Sierning (1200 inhabitants), and Grünau on the Alben, 1750. In this circle lies the *Salzkammergut* (Salt domain of the Crown), between lakes Traun, Atter, and St. Wolfgang, the Salzach circle, and Styria; it contains an area of 238 square miles, and has 78 villages and hamlets, 2450 houses, and 16,200 inhabitants: there is no level land whatever in this district. The salt-mines yield about 40,000 tons of salt, and it is said a clear revenue of upwards of 70,000*l.* annually. Coals, alabaster, and gypsum are also obtained from this district. It contains the market-towns of Ischl on the Traun, with 250 houses and 1800 inhabitants, two salt-works, saline baths, and a theatre and hospital. Hallstatt, on the lake of that name, 1050 inhabitants; Laufen, with 370, and salt and coal-works; Goisern, a village of 756, on the Traun, and Langbath, on the southern side of Lake Traun, with salt-boiling houses, sawmills, &c., and a population of 1100. The Salzkammergut lies between 47° 29′ and 47° 51′ N. lat., and 13° 29′ and 13° 51′ E. long. In the Salzach circle are the towns of Hallein on the Salzach, where there are salt-works and boiling-pans, 330 houses and 3000 inhabitants, and Radstadt, on a hill on the left bank of the Ens, with about 920. In this circle lies the beautiful valley of Gastein among the Alps, from 30 to 40 miles in length and about two in breadth, in which are 21 villages and hamlets, including Hof or Hof in der Gastein, the chief place in the valley, and the baths called Wildbad-Gastein, which have upwards of 1200 visitors in the season. Gredig, with its rich marble quarries and prince's well, the source of the Glanbach, Ebenau, where there is a manufactory of copper, brass, and ironware, and the celebrated springs of St. Wolfgang on the Weissel brook are also in this circle.

(Blumenbach; Lichtenstern; Hassel's *Archduchy of Austria*; Hubner's *Statistics*; *Historical and Statistical Survey of the Austrian Monarchy*; Jenny's *Manual*; *&c.*)

ENSIGN, a commissioned officer, the lowest in degree, and immediately subordinate to the lieutenants in a regiment of infantry. One of this rank is appointed to each company, and the junior ensigns are charged with the duty of carrying the colours of the regiment. Ensigns in the regiments of foot guards have also the rank of lieutenants. In the rifle brigade, and in the royal corps of artillery, engineers and marines, in place of an ensign, a second lieutenant is attached to each company.

Among the Spaniards and Italians, in the seventeenth century, it appears that no officer existed like the lieutenant of a company, whose rank is between that of a captain and ensign, any such being considered superfluous, and as tending to diminish the importance which was attached to the post of the officer who had the charge of the colours, on the preservation of which, in action, the honour of the regiment was made greatly to depend.

When, as formerly, a battle partook far more than at present of the nature of a mêlée, the loss of a standard, which served as a mark for the soldiers under each leader to keep together in the fight or to rally when dispersed, must have been a serious misfortune, and probably was often attended by the total defeat and destruction of the party; and hence, no doubt, arose the point of honour respecting the colours. A French military author, who served and wrote in the time of Charles IX., intending to express the importance of preserving the colours to the last, observes that, on a defeat taking place, the flag should serve the ensign as a shroud; and instances have occurred of a standard-bearer who, being mortally wounded, tore the flag from its staff and died with it wrapped about his body. Such a circumstance is related of Don Sebastian, king of Portugal, at the battle of Alcazar, and of a young officer named Châtelier at the taking of Taillebourg, during the wars of the Huguenots.

In the antient French service, the duty of carrying the oriflamme at the head of the army was confided to a man of rank, and also of approved valour and prudence; the post was held for life.

The price of an ensign's commission in the foot guards is 1200*l.*, and his daily pay is 5*s.* 6*d.*; in the regiments of the line the price is 450*l.*, and the daily pay 5*s.* 3*d.*

ENTABLATURE. [Civil Architecture; Column.]

ENTAIL. [Estate.]

ENTALOPHORA. [Sertulariidæ.]

ENTERITIS, *Inflammation of the Intestines.* The inflammatory affections of the whole alimentary canal constitute an extensive and highly important class of diseases, several of which are properly designated by specific names, since they have a peculiar seat, and require a peculiar treatment. Enteritis is one of these. This term is employed to denote an acute inflammation of the external or peritoneal coat of the intestines. When inflammation is seated exclusively or chiefly in the peritoneal coat of the intestines, both the local and the constitutional affection is widely different from that which is produced when inflammation is seated in the mucous coat. It is therefore with good reason that these diseases are distinguished by different names.

The distinctive characters of enteritis are pain in the bowels, vomiting, invincible constipation, fever, and sudden and great prostration of strength.

The pain is often exceedingly severe, and is usually especially acute about the navel. The inflammation may be confined to a small portion of the intestines, or its seat may be very extensive. The pain is felt in the part in which the inflammation is seated; hence the pain is occasionally restricted to a particular part of the abdomen; but far more commonly it is spread over a large portion of it, and, as has just been stated, is peculiarly severe about the navel. The pain is constantly present; it is never for a moment entirely absent; but it is occasionally very much aggravated in paroxysms. It is always greatly increased by pressure over the seat of the part inflamed. Though severe pain be a very constant attendant on enteritis, yet occasionally cases occur in which the pain is never so great as to occasion much alarm, and these insidious attacks are the most dangerous.

The vomiting, though occasionally absent, is pretty constantly present, and is sometimes frequent and most distressing. In the intervals between the acts of vomiting there is a sense of nausea. It has been thought that when the vomiting is urgent, it is an indication that the inflammation has extended to the stomach; but the inspection of the body after death has fully shewn that there may be most distressing vomiting when not the least appearance of disease can be traced in the stomach.

Obstinate constipation is a diagnostic mark of enteritis.

It is not indeed invariably present, but it is present in so large a proportion of cases, that when absent it must be considered as an exception to the general rule. Its absence should leave no doubt upon the mind of the nature of the attack if the other symptoms are present.

More or less fever is always present. The skin is usually hot and dry, and the heat is often preceded by a sense of chilliness or by a distinct rigor. The tongue is usually white and furred; there is much thirst, and the pulse is quick, small, sharp, and incompressible.

The expression of the countenance is peculiar. The features are sharp and compressed; in severe cases, and in almost all cases in the advanced stage quite sunk; the expression is anxious and wild, and the first glance conveys to the beholder an irresistible conviction that the individual is labouring under some intense internal disease.

The impression upon the powers of life is so great and rapid that the patient is far more exhausted after a few hours' illness in this disease than after an attack of as many days' duration in most other acute maladies. This rapid and extreme prostration is highly characteristic of enteritis, and if it be combined with any one of the symptoms which have been described, should leave no doubt of the existence, in an intense form, of one of the most dangerous diseases to which the human body is subject.

As the inflammation advances the pulse becomes more rapid and feeble; the abdomen swollen, tense, and tympanitic; the prostration increases: the skin, instead of being hot, becomes cold and clammy, and the extremities, more especially, are cold.

The inflammation has a peculiar tendency to terminate in gangrene. Before this event happens it is usually conceived that the inflammatory action extends from the peritoneal to the muscular coat, and that in the most intense cases all the coats of the intestine become involved. The signs that mortification has taken place are cessation of pain, hiccup, increased frequency and weakness of the pulse, greater collapse of the countenance, and increased prostration. But it is remarkable that often when the patient dies under the ordinary symptoms of mortification, on the examination of the intestine after death, nothing can be detected but the usual appearances of inflammation; there is no trace of a gangrenous spot; death is produced by the intensity of the inflammation.

The brain usually remains unaffected to the end; the mental faculties are but little impaired; but sometimes, as the disease advances, the mind becomes confused and wandering, and occasionally delirium sets in early—a certain sign that the disease is of extraordinary intensity.

The exciting causes of the disease are acrid and indigestible matters taken into the stomach in large quantity; habitual full living on highly seasoned food; the accumulation of hardened fæces, cold drinks, especially when the body had been previously overheated. But perhaps the most common cause of the disease is cold, combined with moisture, applied either directly to the abdomen, or to the body generally, and more especially to the lower extremities. It is also frequently superinduced by strangulated hernia; and on the sudden occurrence of the symptoms of enteritis the abdomen should always be carefully examined with a view to ascertain whether hernia be present. It may also be caused by an event which cannot be known until after death—the involution of one fold of the intestine within another (intus-susception or volvulus), so as to occasion a complete obstruction to the passage of the contents of the bowels.

Enteritis can scarcely be confounded with any other disease excepting colic, and the relation between these two affections is so close that severe colic is very apt to lapse into enteritis; and this it is very important that the practitioner should bear in mind. But when colic exists as a distinct disease it is clearly distinguished from enteritis by the absence of fever, and of the prostration so characteristic of enteritis; by the occurrence of the pain more decidedly in paroxysms with intervals of complete ease; by the diminution, not the increase, of the pain on pressure, and by the strikingly different state of the pulse.

Enteritis may attack persons of all ages, from the infant a day old, to the man who reaches the extreme term of human life. It may occur at all seasons of the year. Its attack is often sudden, and it sometimes proves fatal with frightful rapidity. It is by no means uncommon for a person apparently in sound health to be destroyed by this disease within twenty-four hours from the commencement of the attack.

Hence the importance of a knowledge of its early symptoms, and the necessity of attacking it with the utmost promptitude and vigour. The ordinary remedies for inflammation must be employed with decision. The character of the pulse, the sunk countenance, the prostration of strength may appear to contra-indicate blood-letting; but these are false indications, and if regarded, the event will be fatal. After a copious bleeding the pulse often diminishes in frequency and increases in strength; the expression of the countenance improves, and the vital energies recover, as if the system were relieved of an oppressive load. Bleeding must be carried as far as possible, until it appears to have made an impression upon the inflammatory action. It is a very useful practice to bleed from the arm two or three times in succession, after an interval of two or three hours, if the symptoms of inflammation do not abate.

It is without doubt highly desirable to procure evacuations from the bowels; but the disease is to be cured by the removal of the inflammation, not by opening the bowels. Death often takes place though the bowels are opened, and the fatal event is not unfrequently hastened, if not brought about, by the acrid nature of the cathartics given to relieve the constipation. These acrid cathartics, if they open the bowels, do not necessarily save the patient; and if they do not open the bowels they greatly increase the inflammation. Only the mildest aperients should be employed. This is one of the diseases in which the judicious employment of calomel and opium is attended with the best results.

Colic is often converted into enteritis, or a case of enteritis mistaken for colic is frightfully aggravated, by taking spirituous cathartics, as tincture of rhubarb, for the relief of the pain. In no case whatever should any vinous or spirituous cathartic be taken for pain in the bowels, however slight, without the sanction of a medical man. Persons continually sacrifice their lives by taking brandy, or a large dose of some tincture, for what they call spasm of the stomach or bowels. The so-called spasm oftentimes is inflammation, which the stimulus of the alcohol increases to such a degree that the disease is no longer to be restrained by any remedies that can be employed.

ENTOMO'LOGY, that branch of science which treats upon insects. The term *entomology* literally signifies a discourse upon insects, it being derived from the two Greek words *éntomon*, an insect, and *logos*, a discourse.

The term entoma was first applied to these animals by Aristotle, and is synonymous with the Latin word insecta (whence is derived the English name *insects*), both having reference to a striking character exhibited in the insect tribe, that of having the body *insected*, or, as it were, cut and divided into numerous segments. [INSECT.]

ENTOMOSTO'MATA, De Blainville's name for the second family of his first order, *Siphonobranchiata*, of the first subclass, *Paracephalophora Dioica*, of his second class, *Paracephalophora*, of *Malacozoa*. This family appears to be nearly the same with the genus *Buccinum* of Linnæus, and is thus characterized by De Blainville:—

Animal spiral, with the foot, which is shorter than the shell, rounded in front. *Mantle* provided in front of the respiratory cavity with a long canal always uncovered, which the animal uses as an organ of prehension. It is furnished with a single pair of blackish tentacula, which carry the *eyes* on an enlargement (renflement) of the [illegible] of their base. *Mouth* armed with a proboscis, as in the preceding family (*Siphonostomata*), without any labial teeth, but with a small tongue. Organs of *respiration* formed by two unequal pectinated branchiæ. Organs of *generation* —termination of the oviduct in the females at the right side, at the entrance of the branchial cavity. Termination of the deferent canal at the extremity of a long flattened contractile excitatory appendage, situated at the right side of the neck. *Shell* very variable in form, whose opening, sometimes very large, and sometimes very small, is without an apparent canal, or with a very short one suddenly curved upwards, but always more or less deeply notched anteriorly. *Operculum* horny, unguiform, oval, subcentric, with the summit a little marked and marginal.

De Blainville observes that this family differs evidently very little from that of the *Siphonostomata*, whether in the soft parts or in the shell. The species which it embraces are not all absolutely marine, though a very great number of them are; some live at the mouths of rivers, and a very small number are entirely fluviatile.

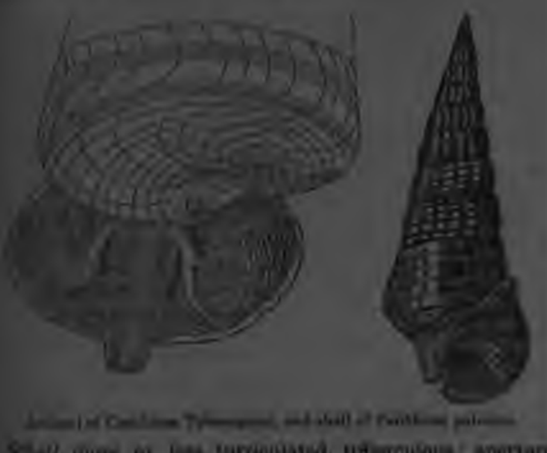
Genera.

*

Turriculated.

Cerithium.

Animal very much elongated, the mantle prolonged into a canal at its right side, but without a distinct tube; the foot terminated by a depressed, proboscidiform muzzle; tentacula very distant, with large rings swollen as it were, in the lower part of their length, and carrying the eyes at the summit of this enlargement. Mouth terminal, in the form of a vertical slit, without any labial teeth, and with a very small tongue furnished with regularly disposed reflexed teeth. A single straight branchia.



Animal of Cerithium Telescopium, and shell of Cerithium palustre.

Shell more or less turriculated, tuberculous; aperture small, oval, oblique; the columellar border very much excavated, callous; the right lip sharp-edged, and dilating a little with age. *Operculum* horny, oval, rounded, subspiral, and striated on its external surface, sunk, and hollowed on its internal surface.

α.

Species which have evidently a small canal very short, and obliquely recurved towards the back.

Example, *Cerithium Vertagus*. Locality, Indian Ocean and Moluccas (Lamarck).

β.

Species which have a still smaller canal, but straight throughout, and a well-formed sinus at the posterior union of the two borders.

Example, *Cerithium Aluco*. Locality, Indian Ocean, and Moluccas (Lam.).

γ.

Species whose aperture is divided into three by the uniting of the slants anterior tube, and that of the posterior sinus. (Genus, *Triphora*, or *Tritoma*, Deshayes.) *Triforis?* Deshayes.

Example, *Cerithium Tristoma*.

δ.

Species which have a small straight canal, and the whorls of the spire flat and ribanded, with a deep umbilicus; two decurrent plaits on the columella, and one on the right lip. (Genus, *Nerinea*, Defrance.)

Example, *Cerithium Nerinea*.

ε.

Species which have no canal, but a simple notch, and whose right lip is much dilated in age. (Genus, *Potamides*, Brongniart; *Pyrazus*, De Montfort.)

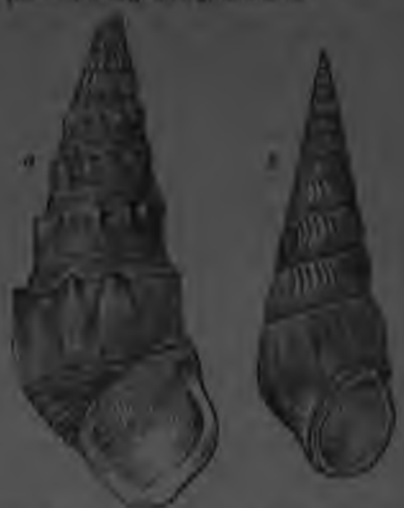
Example, *Cerithium palustre*. Locality, coasts of the East Indies, in the salt marshes (Lam.)

ζ.

Species whose aperture, without a canal, is a little notched in front and rear, the notch being replaced by a sinus; the columellar border curved in its middle; the right lip not dilated. (Genus, *Pirena*, Lam.)

Example, *Cerithium Madagascariense*.

De Blainville makes the genus *Cerithium*, as established by him, contain fifty-six species characterized by Lamarck; adding that the greater part are marine, but many from the mouths of rivers, and some entirely lacustrine, and that there is but one belonging to the French seas (our seas), whilst more than a hundred fossil species are found in France and Italy. M. Defrance's genus *Nerinea*, he remarks, would be better placed among the *Pyramidellæ*.



a, Cerithium Madagascariensis (Lam.); b, C. Madagascariense (Pirena, Lam.) according to De Blainville. N.B. It is not clear that these are not the same species, notwithstanding the comparative smallness of b.

Lamarck places *Cerithium* at the commencement of the first section (Canalifères) of his *Zoophagous Trachelipods*, immediately after *Turritella*, the last of his *Phytiphagous* (Plant-eating) *Trachelipods*.

Cuvier gives it a position after *Purpura*, *Cassis*, and *Terebra*, and before *Murex*. This, as the Rev. M. J. Berkeley and Mr. Hoffman observe in their interesting paper on the anatomical structure of *Cerithium Telescopium*, would imply a structure of the parts of the mouth adapted for boring shells, according to the known habits of *Murex*, and certain allied genera; but, they remark, a single glance at Adanson's figure is sufficient for conviction that the animal is much more nearly allied to the *Trochoidæ*, and that Lamarck judged rightly, according to the evidence before him, in placing it on the confines of his two great classes. This is corroborated, they add, by the little additional information of M. Sander Rang, who describes the mouth as toothless, but furnished with a small tongue.

M. Sander Rang states that this genus, so numerous in species both living and fossil, contains only marine animals; but, nevertheless, there are some of them which live at the mouths of rivers, and these are precisely the individuals which M. Brongniart has united to form the genus *Potamides*, which cannot be adopted in zoology, inasmuch as it does not rest upon sufficiently marked characters. M. Rang adopts, generally, the divisions of De Blainville with approbation, but he rejects the sixth group (ζ), which comprehends the genus *Pirena*, which Rang, following the example of M. de Férussac, places with *Melanopsis*. Rang agrees with De Blainville in thinking that the division containing Defrance's *Nerinea* is, perhaps, doubtful, and that its position would be better near the *Pyramidellæ*. He observes that they have in France but two or three living *Cerithia*; but a great number of fossil species.

Deshayes makes the number of living species eighty-seven; not reckoning *Triforis*, of which he gives three species, nor *Pirena*, of which he also gives three; of the latter Lamarck records four.

Anatomy, Habits, &c.—Our limits make it necessary to refer the reader to the paper of the Rev. M. J. Berkeley, A.M., and G. H. Hoffman, Esq., for the anatomy of *Cerithium* (*Zool. Journ.*, vol. v., p. 431). Adanson, speaking of the habits of one of the species, says that it lives in the sand amongst grass and mangroves, feeding on 'scolopendras,' and other small marine worms. The individual which formed one of the subjects of the investigation by Mr. Berkeley and Mr. Hoffman, and which was brought from Calcutta, though placed in fresh sea-water, the utmost care being taken to renew it frequently, and though all kinds of marine substances were supplied to the animal for food, refused all nourishment, contenting itself with simply walking over the substances, and, in so doing, touching them with its proboscis. As it would not feed, this individual was killed by immersion in spirit. The other specimen, which was anatomized by the zoologists above mentioned, was brought from Ceylon. Mr. Gray (March 25, 1834) read a note to the Zoological Society of London, giving an account of the arrival in England of two living specimens of *Cerithium armatum*, which had been obtained at the Mauritius, and had been brought from thence in a dry state. That the inhabitants of *land shells* will remain alive without moisture for many months, is, he remarked, well known. [BULINUS, vol. vi., p. 8]. He had had occasion to observe that various marine *Mollusca* will retain life in a state of torpidity for a considerable time; some facts, in illustration of which, he had communicated to the Society (*Zool. Proc.*, part i., p. 116). The present instance included, however, a torpidity of so long a continuance as to induce him to mention it particularly. The animal, though deeply contracted within the shell, was apparently healthy, and beautifully coloured. It emitted a considerable quantity of bright green fluid, which stained paper of a grass-green colour: it also coloured two or three ounces of pure water. This green solution, after standing twelve hours in a stoppered bottle, became purplish at the upper part; but the paper retained its green colour though exposed to the atmosphere. A specimen of *C. Telescopium*, sent from Calcutta to Mr. G. B. Sowerby in sea-water, lived out of water in a small tin box for more than a week. *Cerithium* has been found in the sea on various bottoms, and in estuaries, at a depth ranging from the surface to seventeen fathoms.

FOSSIL CERITHIA.

Deshayes in his tables gives the number of fossil (tertiary) *Cerithia* at 220, and of these he records *Cerithia vulgatum*, *Latreillei*, *doliolum*, *giganteum*, *alucaster*, *granulosum*, and *bicinctum*, as both living and fossil. He gives two fossil (tertiary) species of *Pirena* and two of *Triforis*. The form is found from the Supracretaceous to the Oo group, both inclusive. *Potamides* is recorded in the we clay Sussex (Mant.); and *Nerinea* in the Oolitic gr (Bailly), near Auxerre, St. Mehiel (Meuse), Kimmeridge Clay, Coral Rag, Bernese Jura, Forest Marble, Oxford oolite, Dorset (*Nerinea*, *Goodhallii*), Inferior oolite.

Mr. Lea (*Contributions to Geology*) describes and figures from the Claiborne beds a shell which he names provisionally *Cerithium? striatum*; observing that he is by no means satisfied in placing this shell among the *Cerithia*. It has a stronger resemblance in the mouth to the genus *Melania*, but being a marine shell cannot, he remarks, with propriety be placed in that genus. De Blainville, he adds, figures a shell (*Malacalogie*, pl. 21, bis, fig. 2), under the name of *Potamides fragilis*, which certainly ought to belong to the same genus with this, the mouth being very nearly the same. Until more species shall be obtained, Mr. Lea has forborne to create for it a new genus. He further states, that there have been no *Cerithia* yet found in the beds at Claiborne, although they abound in England and on the Continent in the tertiary formation, there being 137 species in the Paris basin alone.

Melanopsis.

Animal furnished with a proboscidiform muzzle, with two contractile, conical, annulated tentacula, having each at their external base an oculated peduncle; foot attached to the neck; respiratory orifice in the canal formed by the union of the mantle with the body. *Shell* with an epidermis, elongated, fusiform or conico-cylindrical, with a pointed summit; whorls of the spire from six to fifteen, the last often forming two-thirds of the shell; aperture oval, oblong; columella solid, callous, truncated at its base, separated from the anterior border by a sinus, the callosity prolonged upon the convexity of the penultimate whorl, forming a canal backwards; sometimes a sinus at the posterior part of the right border. *Operculum* horny, subspiral.

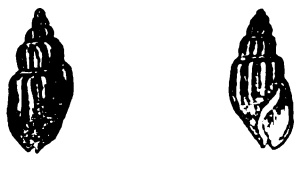
Habits, &c.—The genus is rather fluviatile than marine, contrary to *Cerithium*, according to De Blainville. Lamarck, who gives but two species, *M. costata* and *M. lævigata*, speaks of them decidedly as fluviatile. Rang says that the genus was established by M. de Férussac for fresh-water shells, whose callous and truncated columella did not permit their arrangement with *Melania*. The latter, in his monograph, divides them into two groups, the first consisting of those species which have a single sinus at the border of the aperture, separating it from the columella (*Melanopsis*, Lam.; *M. buccinoidea*); the second consisting of those species which have two distinct sinuses at the external border of the aperture, one which separates it from the columella, the other situated near the union of the border with the penultimate whorl. (*Pirena*, Lam.) De Blainville gives the following division of the genus.

a.

Subturriculated species.

Example.—*Melanopsis costata.*

Locality.—Syria in the Orontes (Lamarck).



Melanopsis costata.

β.

Oval species.

Example.—*Melanopsis buccinoidea.*

γ.

Convex species (Espèces rouflées).

Example.—*Melanopsis Bouei.*

It appears to us that *Pirena* comes more appropriately in the place assigned to it by M. de Férussac and M. Rang than in that allotted to it by M. de Blainville.

M. Deshayes gives ten living species of *Melanopsis* and, as has been stated above, three of *Pirena*, Lamarck gives four.

FOSSIL MELANOPSIDES.

M. Deshayes, in his tables, gives eleven fossil (tertiary) species of *Melanopsis*, and of these he records the following species, *Melanopsides buccinoidea*, *Dufourei*, *costata*, *nodosa*, *acicularis*, and *incerta*, as both living and fossil (tertiary). Of *Pirena*, he records two fossil (tertiary) species. Dr. Fitton, in his Systematic and Stratigraphical List of Fossils of the strata below the chalk (*Trans. Geol. Soc.*, 2nd series, vol. iv.), mentions two species with a note of interrogation after the generic name, viz., *M. attenuata* and *M. tricarinata*, from the weald-clay, Dorsetshire, and the Hastings' sand, Sussex. He also alludes to a third unnamed species with a query, from the Purbeck, Bucks.

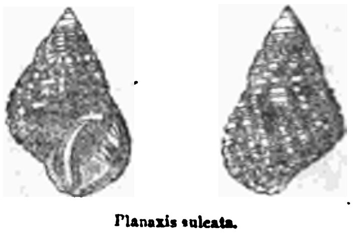
Planaxis.

Animal unknown. *Shell* oval, conical, solid, transversely furrowed; aperture oblong; columella flattened and truncated anteriorly, separated from the right border or lip by a sinus; right lip furrowed or rayed within, and thickened by a decurrent callosity at its origin. *Operculum* horny, oval, duplicate, subspiral.

Lamarck established this genus for certain small shells, approximating closely to the *Phasianellæ*, but differing from them by the truncation of the anterior part of the columella. He only records two species, viz., *P. sulcata* and *P. undulata*. M. Rang states that he possesses six well-distinguished species.

Habits, &c.—*Planaxis* is a littoral shell, and is sometimes found under stones. M. Rang says that he had had occasion to observe the animal at the Isle of France, where the rocks are sometimes covered with them, but, having lost his notes, he is unable to give its principal characters. According to his recollection, the animal differed very little from that of *Phasianella*. M. Deshayes in his tables puts the living species at four.

Example.—*Planaxis sulcata.*



Planaxis sulcata.

FOSSIL PLANAXES.

Deshayes in his tables gives five fossil (tertiary) species.

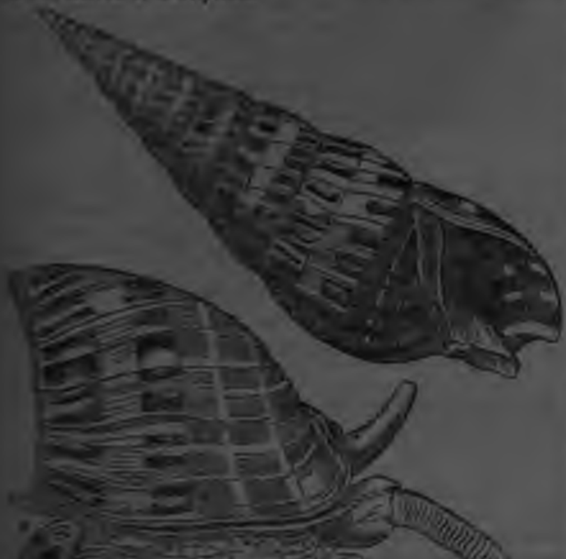
Subula.

Animal spiral, very much elevated; foot very short and round; head with extremely small triangular tentacula, bearing the eyes at their summit; a long labial proboscis without hooks (crochets), at the bottom of which is the mouth equally unarmed. *Shell* without an epidermis, turriculated, and with a pointed spire; whorls smooth, ribanded, bifid; aperture oval, small, deeply notched anteriorly; external lip thin and sharp-edged; internal or columellar lip with an oblique *bourrelet* at its extremity. *Operculum* oval, horny, lamellar, and as it were imbricated.

M. *de* Blainville thus characterises a genus which he says he found himself compelled to establish upon examining the animal brought home by MM. Quoy and Gaimard, the shell of which had been hitherto confounded with the *Terebræ*; and he arranges under this new genus all those species whose shell is *very much elevated*, whose spire is very pointed, and whose whorls are (banded); and, consequently, the greatest number of the twenty-four living species characterised by Lamarck, and which nearly all belong to the East Indies and Australasia.

Example.—*Subula maculata* (Lam.), *Buccinum maculatum* (Linn.).

Locality.—Moluccas and Pacific Ocean, according to Lamarck, who speaks of his possession of a specimen taken on the shores of Owhyhee.



Shell of Subula maculata, and last whorl of the shell with the animal and operculum a.

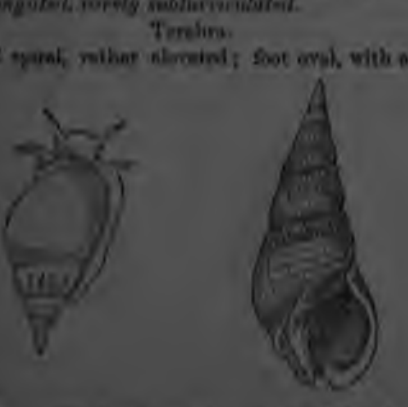
M. Rang observes that it is much to be desired that new observations on the animals of these shells may lead to the decided line of separation between the *Subulæ* and the *Terebræ*.

* *

Turbinaceous; or genera whose spire is moderately elongated, rarely subturriculated.

Terebra.

Animal spiral, rather elevated; foot oval, with a transverse anterior furrow and two lateral auricles; head bordered with a small fringe; cylindrical tentacula terminated in a point and very distant; eyes but little apparent at the origin and outside of the tentacula; mouth without a proboscis; tube of the respiratory cavity very long. *Shell* without an epidermis, inclining to oval; spire sharp, not much elevated or subturriculated; aperture large, oval, strongly notched anteriorly; columella with an oblique bourrelet at its extremity. No *operculum*. (De Blainville.)



Animal of Terebra (Vis Merou) from Adanson, and shell of Terebra vittata.

M. De Blainville only leaves in this genus, which he thinks ought perhaps to belong to the family of nonoperculated *Entomostomata*, those species of Lamarck's *Terebræ*, which, in their general form, bear some resemblance to the *Buccina*, such, for example, as his *Vis buccinale* (*Terebra vittata*); because De Blainville supposes that the animal resembles that of the *Mérou* of Adanson, which is the type, and which differs much from that of the subulated species to which De Blainville gives the generic name of *Subula*, *Alêne*, in French.

Habits, Locality, &c.—The species, De Blainville observes, appear to come from warm climates only, like the *Subulæ*. *Terebra* (Lamarck) occurs at depths ranging from the surface to 17 fathoms. The species sometimes creep on reefs out of the water, but within reach of the spray.

Since the publication of the works of M. De Blainville and of M. Rang, Mr. Gray, on the 8th July, 1834, exhibited an extensive series of the shells of *Terebra*, and enumerated 45 species (21 of them new), all of them either in the British Museum or in his own private collection. He stated that the animal has a small foot, and a very long *proboscis*, at the base of which are seated two very small *tentacula*; the *operculum* is ovate, thin, horny, rounded behind, and rather tapering in front. The shell is covered by a very thin, pellucid, horn-coloured *periostraca*: it is usually white, variously streaked with brown, the streaks being often interrupted or broken into spots by the two spiral bands of the shell; one of these bands is placed near the spiral groove and the other on the middle of the whorl. The apex of the cavity is frequently filled up by a calcareous deposition; but this deposition has never been observed in *Ter. duplicata*. Mr. Gray divides the species into the three following sections. 1st. *Anfractibus sulco spirali cingulum posterius efformante; labio interiore, tenui concavo.* He observes upon this section, that the cingulum is most conspicuous in young shells; and that the internal lip is very rarely thickened in adults. To this section he refers 30 species (*Terebra maculata*, Lam., &c.), 15 of them new. 2nd. *Anfractibus sulco spirali cingulum posterius efformante; labio interiore incrassato, subelevato.* He observes that the species of this section (seven, five of which are new) somewhat resemble the *Cerithia* in the aperture. 3rd. *Anfractibus sulco postico nullo.* These last he divides into two sub-sections * *with a thin internal lip*, which he subdivides into (*a*) those species which have an *elongated slender shell*, and (*b*) those which have a *short shell*, and * * *with the internal lip thickened and elevated, and the shell short*; and he observes that these approximate somewhat to the *Nassæ*, but have neither the internal dilated lip, nor the external thickened lip. This third section contains eight species, one of which is new.

Mr. Gray does not notice *Subula* of De Blainville, and it may therefore be considered that he does not admit the generic distinction.

FOSSIL SUBULÆ and TEREBRÆ.

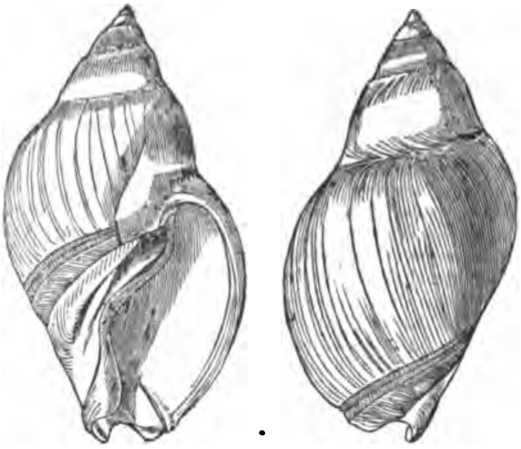
De Blainville refers to his genus *Subula* many of the fossil species which had been considered as *Terebræ*, and which coincide with his definition of the former genus; but he does not enumerate the species, nor draw any distinct line of demarcation between the fossils of these respective genera. He remarks that M. Defrance makes the fossil species of both these genera seventeen, of which five are identical, three from Italy, one from Grignon, and one from Bourdeaux. The 'vis scalarine fossile de Parnes' De Blainville thinks should be referred to the genus *Terebra*. M. Deshayes, in his tables, makes *Terebra* (of Bruguière and Lamarck we presume, for he does not notice *Subula*) consist of 44 living species and 16 fossil (tertiary), of which last he considers two new species, and *Terebræ Faval*, *strigilata* and *pertusa*, to be both living and fossil (tertiary). Dr. Fitton, in his stratigraphical and local distribution of the fossils of the strata below the chalk, records *T. Port-*

landica as occurring in the Portland stone in Dorset, South Wilts, North Wilts, Oxford, and Bucks. Mr. Lea describes and figures three additional species of *Terebra* (Lamarck) from the Claiborne beds, remarking that four species of the genus have been observed in England, three in the Oolitic group, and one in the London clay. He refers to the 16 species given for the tertiary by M. Deshayes, and says that ten of these are found at Baden (Miocene) and seven at Bourdeaux (Miocene). Here is evidently an error in the number. He adds that Mr. Conrad had observed one species, which he calls *simplex*, in the tertiary of Maryland, 'being the only one heretofore observed,' adds Mr. Lea, 'in our formations.'

Eburna.

Shell oval or elongated, smooth; spire pointed, whorls running together as it were, without a marked distinction of suture; aperture inclining to oval, elongated, widened, and deeply notched in front; right lip entire; columella callous posteriorly, umbilicated subcanaliculated at its external part.

Geographical Distribution.—The seas of warm climates; sandy mud? Of the five living species, Lamarck refers the locality of three to the East Indies and one to South America and perhaps India.



Eburna glabrata.

Fossil Eburnæ.

De Blainville states in his 'Malacologie' (1825) that no *Eburnæ* had then been discovered in a fossil state. M. Rang remarks (1829) in his 'Manuel' that there are fossil species. Deshayes, in his tables, records five living species and one (new species) fossil (tertiary).

Buccinum.

To avoid repetition the reader is referred to the character of the family at the beginning of the article for a general description of the animal. Dr. Buckland observes that the organ by means of which the carnivorous Trachelipods bore holes through shells for the purpose of extracting the juices of the animal is well exemplified in the English species *Buccinum Lapillus* (*Purpura Lapillus*) and *Buccinum undatum*. The proboscis is armed with a number of minute teeth set upon a retractile membrane for the purpose of perforation. Mr. Osler (Phil. Trans., 1832) gives a figure of the rasp-like perforating tongue of *B. undatum*. See also Dr. Buckland's *Bridgewater Treatise*.

Shell oval, elongated, with a pointed but moderately elevated spire; aperture oblong or oval, deeply notched anteriorly; right lip entire, sometimes thick; columella simple or callous; *Operculum* horny, oval, subconcentric; summit but little marked and marginal.

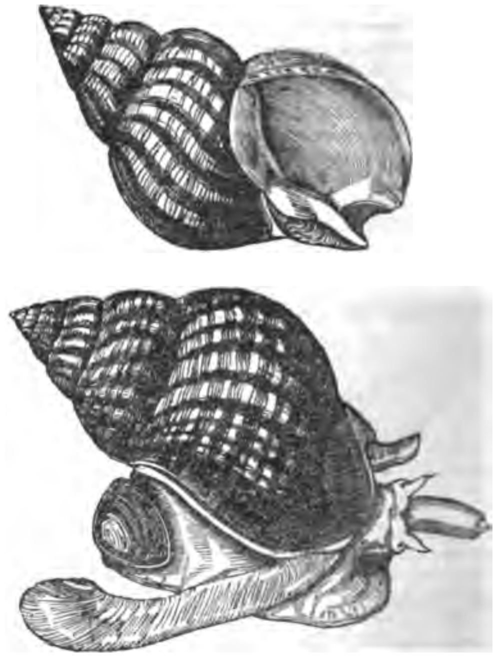
Geographical Distribution.—Very wide. Species occur in almost all seas. *Buccinum glaciale* and *Buccinum Sabinii* are noted in the supplement to the appendix of Captain Parry's first voyage as having been met with during the period in which the expedition remained within the Arctic circle.

Habits.—The species have been found at depths ranging from the surface to 17 fathoms. The greater part of the genus is littoral.

M. De Blainville subdivides the species into many sections comprehending the true *Buccina*, including the genera *Alectrion* (*B. papillosum*) and *Cyclops* (*B. neriteum*) of De Montfort, and the genus *Nassa*, Lamarck. M. De Férussac divides the genus into two subgenera, viz., *The Buccina properly so called*, of which *B. undatum* may be considered the type, and the *Eburnæ*. M. Sander Rang adopts this arrangement. We confine ourselves to the true *Buccina*.

The species are very numerous. Deshayes, in his tables, gives 140, and new species are continually arriving. Mr. W. Lytellton Powys, for instance, describes (Zool. Proc., 1835,) four new species from Mr. Cuming's collection.

Example.—*Buccinum undatum*. *The Waved Whelk.*



Shell of Buccinum undatum, and animal (male) creeping with its shell and operculum.

This is the species so commonly exposed for sale as food on the street stalls in the metropolis. Pennant, speaking of another species that occurs in vast abundance on our rocks near low-water, namely, *B. Lapillus* (*Purpura Lapillus*) above alluded to, remarks that it is one of the English shells that produces the purple dye, analogous to the *Purpura* of the antients; and Mr. William Cole, of Bristol, thus describes (1684) the process of obtaining the English *Purpura*:—'The shells, being harder than most of other kinds, are to be broken with a smart stroke with a hammer, on a plate of iron or firm piece of timber (with their mouths downwards), so as not to crush the body of the fish within; the broken pieces being picked off, there will appear a white vein, lying transversely in a little furrow or cleft, next to the head of the fish, which must be digged out with the stiff point of a horsehair pencil, being made short and tapering. The letters, figures, or what else shall be made on the linen (and perhaps silk too), will presently appear of a pleasant light green colour, and, if placed in the sun, will change into the following colours, *i.e.*, if in winter, about noon; if in the summer, an hour or two after sun rising, and so much before setting; for in the heat of the day, in summer, the colours will come on so fast, that the succession of each colour will scarcely be distinguished. Next to the first light-green it will appear of a deep-green, and in a few minutes change into a sea-green; after which, in a few minutes more, it will alter into a watchet-blue; from that, in a little time more, it will be of a purplish-red; after which, lying an hour or two (supposing the sun still shining), it will be of a very deep purple-red, beyond which the sun can do no more. But then the last and most beautiful colour, after washing in scalding water and soap, will (the matter being again put into the sun or wind to dry) be of a fair bright crimson, or near to the prince's colour, which afterwards, notwithstanding there is no use of any stiptic to bind the colour, will continue the same, if well ordered, as I have found in handkerchiefs that have been washed more than forty times; only it will be somewhat allayed from what it was after the first washing. While the cloth so writ upon lies in the sun, it will yield a very strong and fœtid smell, as if garlic and *asafœtida* were mixed together.' (Phil. Trans., Abr. II. 826.)

We have inserted this account here, because the shell which is the subject of it may be more familiar to our readers under the Linnæan name of *Buccinum Lapillus* than of *Purpura Lapillus*, but it is properly arranged under the genus *Purpura*.

FOSSIL BUCCINA.

M. Deshayes in his tables makes the number of fossil (tertiary) species 95, and he records the following as both living and fossil (tertiary), *Nassa* not appearing as a genus in his list,—*Buccina undatum, reticulatum, maculosum, mutabile, clathratum, neriteum, Desnoyersi, prismaticum, asperulum, musivum, inflatum, polygonum, D'Orbignii, Linnæi, politum*, and five new species, the names of which are not given. Dr. Fitton in his 'Stratigraphical and Local Distribution' notes two species below the chalk, viz., *B. angulatum* and *B. naticöide* in the *Portland stone* (N. Wilts, S. Wilts, Bucks), and the last-named species in the *Portland sand* (Bucks). Mr. Lea notes one species (new), *B. Sowerbii*, in the Claiborne Beds, Alabama. He observes that of the genus 27 species, including *Nassu*, have been observed in Great Britain, several as low as the mountain limestone, but chiefly in the London clay and the crag. After repeating the number given by Deshayes, Mr. Lea says that the genus appears to be much more abundant in the upper formations. The Pliocene of the sub-apennines furnishes 27 species. Bourdeaux (Miocene) 21. Paris (Eocene) 9. In America, he adds, four species have been found, Mr. Say having described two from the older Pliocene, Maryland, and Mr. Conrad two from York Town, Virginia, also older Pliocene.

NASSA.

Animal very much depressed, with a very large foot extending beyond the body on all sides, but especially in front, where it is large and angular, whilst posteriorly it is insensibly narrowed. For the rest like the animal of *Purpura*. *Shell* globular, oval or subturriculated; aperture oblong, notched anteriorly; right lip sharp-edged, often plaited within; columellar lip covered with a large callous plate, extending more or less far. *Operculum* horny.

Mr. Lea (*Contributions to Geology*) says, 'I have not hesitated to separate this genus from *Buccinum* (although Lamarck united them after having made the division) because they certainly form a very natural group. Cuvier separates it, as M. de Blainville also does, into a sub-genus.' M. de Blainville certainly makes one of his sections of Buccinum consist of the genus *Nassa;* but Rang separates it decisively.

Geographical Distribution. There are many living species mostly from the warmer climates. A very small number belong to Europe.

Habits. Much like those of *Buccinum.* The species have been found on reefs, coral sand, sand, sandy mud, and under stones, at depths ranging from the surface to 15 fathoms.

Mr. Powys has lately described eight new species from Mr. Cuming's collection. Example. *Nassa nodifera.* Locality. The Gallapagos Islands and the shores of Panama.

FOSSIL NASSÆ.

There are many fossil *Nassæ*, as the reader must have collected from the notice of the genus among the fossil *Buccina*. Mr. Lea describes and figures a new species from Claiborne, and adds that Mr. Conrad has observed in the tertiary of Maryland four species, three of which have been described by Mr. Say, in a recent state, upon the American shores. The genus occurs among the Gosau fossils, and Dr. Fitton in his Stratigraphical Table records two species below the chalk, viz., *N. costellata* and *N. lineata*, both from Blackdown.

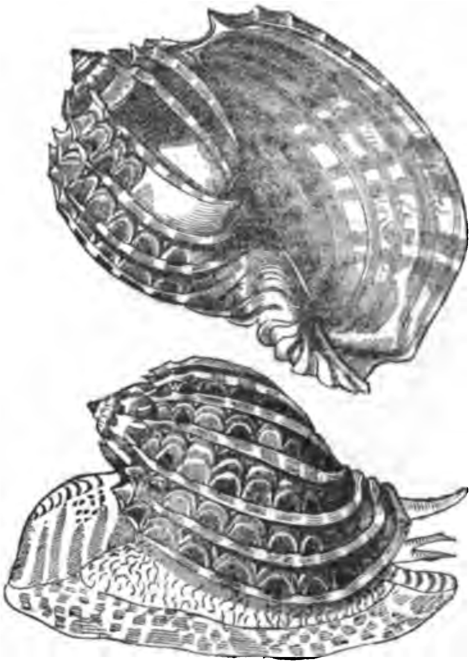
* *

Ampullaceous Entomostomata, or those whose shells are, in general, globular.

Harpa.

Animal with a large head, without a proboscis, having the mouth opened below; two anterior tentacula, conical and very much approximated, carrying the eyes upon an enlargement situated externally a little below the middle; foot large, furnished anteriorly with a sort of heel; siphon rather large and a little elongated; branchial pectinations unequal, two in number; orifice of the oviduct at the entrance of the branchial cavity of the right side, orifice of the deferent canal at the extremity of a very voluminous excitatory organ; vent on the same side.

Shell oblong, more or less convex, generally rather delicate, enamelled, furnished with regular longitudinal ribs; spire a little elevated and pointed, the last whorl very large; aperture oval, elongated, widely notched anteriorly, the right lip with an external *bourrelet*, columella simple, pointed anteriorly. No *operculum* according to M. Reynaud.



Shell of Harpa ventricosa, and animal crawling with its shell.

Geographical Distribution, Habits, &c.—The genus is found in the seas of warm climates, and is more especially abundant at the Mauritius and the neighbouring islands, whence the finest of the more common species and the many-ribbed harps are procured. The animal is said to be of a rich vermilion red. The fishery is principally carried on at low water with a small rake, to which a net is attached, on sand-banks at night, and at sunrise when the harps are probably out upon their feed. They have been known to take the bait on the fishing lines laid for olives (*Oliva*). MM. Quoy and Gaimard, and, afterwards, M. Reynaud state, that the animal of the harp can, sometimes, when attacked by an enemy, disembarrass itself of the posterior part of the foot, and completely withdraw itself into the shell. M. Reynaud explains this phenomenon by giving his opinion that the transverse laceration which causes, in the movement of contraction exerted by the animal, the separation of the posterior part of the foot, arises from the resistance which that part, too voluminous to enter the shell after the animal, encounters from the edges of the shell. M. Rang observes, that though no operculum has been found, (and the animal appears to have been carefully examined,) he does not hesitate to leave the genus among those which are provided with one, because, in the first place, *Harpa* is similarly organised, and, in the next, if deprived of that appendage, it has, at least, the posterior part of the foot to take, in some sort, its place.

Authors generally make the number of living species eight, and of these the most precious, though lately greatly depressed in value, is the *Many-ribbed Harp* (*Harpa imperialis.*) But some of the species are very difficult of definition, though others are well marked. The shells when in fine condition are great favourites with collectors, and, indeed, a drawer of fine harps in all the freshness of their beauty is a sight worth seeing. Care should be taken to keep them with their mouths downwards and from the sun and light, or their brilliant colours will soon fade.

Example, *Harpa ventricosa.* Locality, Mauritius, &c.

FOSSIL HARPS.

Only two species are recorded, in the tertiary formation.

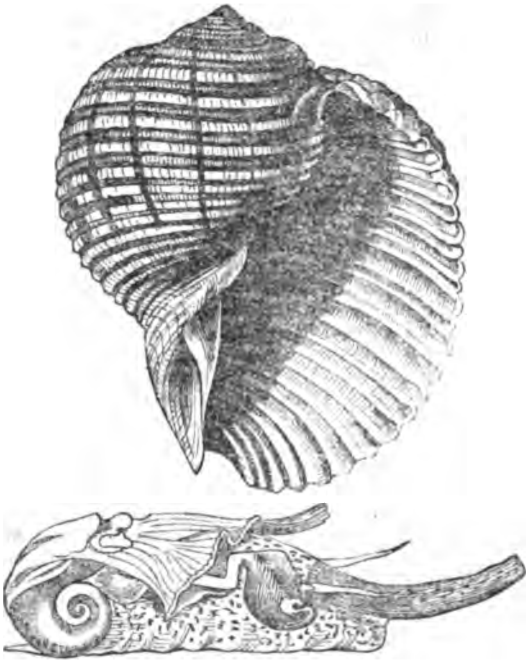
De Blainville adds, that one of these is an analogue, but Deshayes, who gives Paris as the locality for both, does not rank either of them among the species found both living and fossil.

Dolium.

Animal generally resembling that of *Purpura*. *Shell* delicate, nearly globular, ventricose, furrowed transversely; spire but little elevated, pointed, the last whorl forming nearly the whole of the shell; aperture large, oval, right lip undulated; columella often twisted, *operculum* horny.

Geographical Distribution.—The seas of warm climates, especially those of India. One species, *Dolium galea*, inhabits the Mediterranean. The species are often found on reefs, some of them are very large. Seven seems to be the greatest number hitherto recorded, and Cuvier has separated the species into two sections, viz.: The Tuns (*Dolium*) and the Partridge Tuns (*Perdix* of De Montfort).

Examples, *Dolium galea*, and *Dolium perdix*.



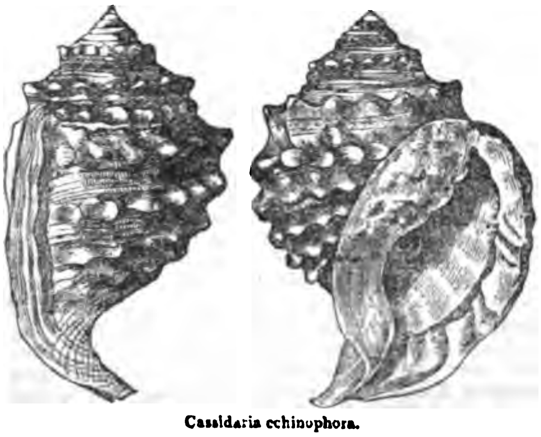
Shell of Dolium Galea, and animal denuded (diminished).

FOSSIL DOLIA.

Deshayes gives but one fossil (tertiary) species, and that (*D. pomum ?*) he gives doubtingly, placing it in the column headed 'species found both living and fossil (tertiary).' De Blainville alludes to four fossil species, two of which are analogues, according to Brocchi.

Cassidaria.

Animal supposed to bear a general resemblance to that of *Buccinum* and *Purpura*. *Shell* ovöid, ventricose, with the spire but little elevated; aperture long, rather narrow, with the anterior canal recurved; right lip furnished with a *bourrelet;* columellar lip covered by a large callosity, often granulous or wrinkled. *Operculum* horny.



Cassidaria echinophora.

Geographical Distribution.—The seas of comparatively warm climates. Lamarck gives the Mediterranean as the locality of two species. Rang states that only one species is European. De Blainville speaks of the genus as inhabiting all seas except that of the North.

The number of living species recorded appears to be seven.

Example, *Cassidaria echinophora*. Locality, the Mediterranean.

FOSSIL CASSIDARIÆ.

Deshayes, in his tables, states the number of fossil (tertiary) species to be eight; and of these, two, viz., *C. echinophora* and *C. Tyrrhena*, he records as both living and fossil (tertiary).

Oniscia.

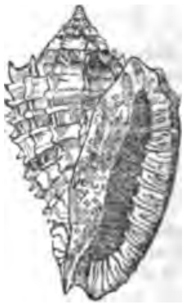
A genus separated from *Cassidaria* by Mr. G. B. Sowerby, and considered by him as having its place next to that genus in the natural system. It differs from *Cassis* in the canal not being suddenly reflected; but Mr. Sowerby states that he has seen *Cassides* which very nearly approach *Oniscia* in the form of the aperture, and in the short, scarcely reflected canal. He thinks that the genus is intermediate between *Cassidaria* and *Cassis*.

Shell oblong, subcylindrical, apex generally rather obtuse, spire short, sometimes very short; base rather acuminated; aperture longitudinal, elongated, extending at the base into a very short canal: outer lip thickened, denticulated within, and rather contracted in the centre; inner lip expanded and covered with granules (Sowerby). The outside of the shells is tuberculated, cancellated, or ribbed. 'Of the animal,' says Mr. Sowerby, 'we know nothing but there is every reason for believing it to be related to that of *Cassis*, and that it has an operculum, though we have never seen it.'

Habits.—Littoral. Found in coarse sand.

Three living species are recorded, one from the South Seas.

Example, *Oniscia cancellata*. (Sowerby's Genera, Oniscia, fig. 1, 2, adult; 3, young. N.B. the specimens figured were from Mr. Broderip's collection, now in the British Museum.)



Oniscia cancellata, adult.

FOSSIL ONISCIA.

One fossil species only is recorded. It is figured by Mr. G. B. Sowerby from the Italian tertiary.

Cassis.

Animal said to resemble generally that of *Purpura*.

Shell inclining to oval, convex, with a spire but little projecting, nearly flat; aperture oblique, long and narrow, with the anterior canal very short and recurved towards the back; right lip thick, furnished with an external *bourrelet*, and toothed within; columellar lip callous, nearly straight, and marked nearly throughout its length with transverse long teeth. *Operculum* horny, very rudimentary.

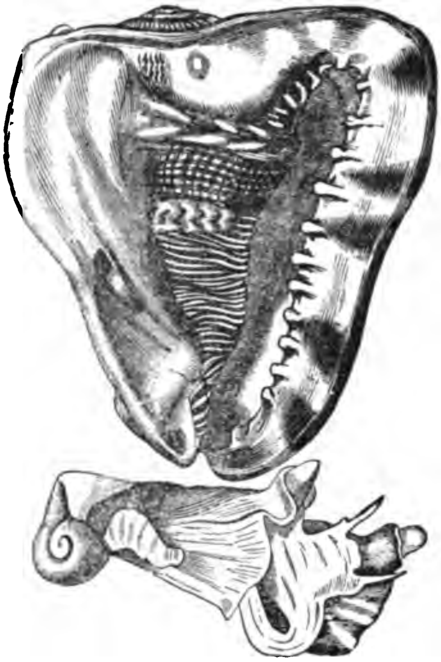
Geographical Distribution.—The genus occurs principally in very warm latitudes; two or three are said to be found in the Mediterranean.

Habits.—The species have been found at depths ranging from five to eight fathoms on sands.

Deshayes gives thirty as the number of living species. These are divided into two groups by Lamarck; the first consisting of those species whose spire is marked by *bourrelets* (*C. cornuta*, for example); and the second of those whose spire is without bourrelets (*C. rufa*, for example).

De Blainville divides the species into two groups also, the first consisting of those whose aperture is long, and external lip nearly straight (*C. tuberosa*, for example); the second of those whose aperture is suboval, and the external lip excavated (*C. flammea*, for instance).[*]

Example, *Cassis tuberosa*. Locality, West Indian Seas.



Shell of Cassis tuberosa, and animal, denuded, of Cassis sulcosa (diminished).

Fossil Cassides.

Deshayes, in his tables, states the number of fossil (tertiary) species to be fifteen, of which he records *Cassides flammea*, *granulosa*, *crumena*, *saburon*, *bisulcata*, and a new species, as both living and fossil (tertiary).

Ricinula.

Animal nearly entirely resembling those of *Buccinum* and *Purpura*. Mantle provided with a tube; foot much wider, and auriculated, as it were, anteriorly; head semilunar, with conical tentacula, supporting the eyes at the middle of their external surface; excitatory organ of the male very large, recurved in the branchial cavity. Such is De Blainville's description, who made his observation on 'la Ricinule horrible,' *Ricinula horrida*.

Shell oval or subglobular, thick, beset with points or tubercles, with a very short spire; aperture narrow, long, with a notch (which is sometimes subcaniliculated) anteriorly; right lip often digitated externally and toothed within; the left lip callous and toothed or wrinkled.

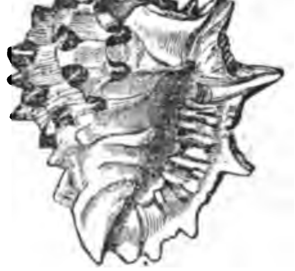
Operculum horny, oval, transverse, concentric. De Blainville describes the elements of the operculum as a little imbricated.

Geographical Distribution.—De Blainville says that of nine species of this genus, all those whose locality is known come from the Indian Seas.

Habits.—The species have been found on coral reefs and rocks.

Deshayes, in his tables, gives the number of recent species as fourteen. De Blainville separates the species into three sections: the first consisting of those with an evident canal anteriorly and behind the aperture (en arrière de l'ouverture) *Ricinula digitata;* the second of those without a canal and beset with spines, *R. horrida;* and the third of those without a canal and tuberculous, *R. morus*. He observes that this genus is evidently artificial: thus it contains one species which is a true *Murex*, whilst others are closely approximated to certain species of *Turbinella;* in fact, they have two or three plaits on the columella; finally, some of them scarcely differ, he says, from the true *Purpuræ*.

Example, *Ricinula horrida*.



Ricinula horrida

Fossil Ricinulæ.

De Blainville and Rang both say that there is no fossil *Ricinula*. Deshayes, in his tables, records one, a new species, in the tertiary formations. (Bourdeaux, Dax, Turin.)

Cancellaria.

Animal said to resemble generally that of *Purpura*.

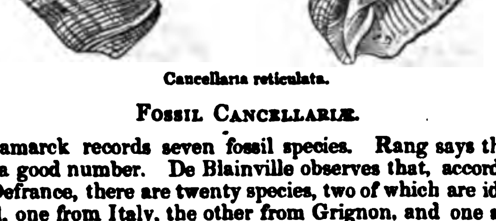
Shell oval or globular, rather convex, reticulated, thick, with a spire slightly elevated and pointed; aperture demioval, notched or subcaniliculated anteriorly; right lip sharp-edged, striated within; columella nearly straight, with many well defined plaits. *Operculum* horny.

Geographical Distribution.—The species are all exotic, and the inhabitants of warm seas. The localities of the bulk of those known are said by De Blainville to be inhabitants of the Indian and African seas (but see below).

Habits.—The species have been found on sandy bottoms, at a depth ranging from seven to sixteen fathoms.

De Blainville speaks of twelve recent species. He observes that the genus as adopted by him is not entirely the same as that of Lamarck, who gives that number. De Blainville withdraws from the genus the species whose aperture is evidently caniliculated, such as *C. senticosa*, which, as it appears to him, ought to remain among the *Murices* or the turriculated *Turbinellæ*. Deshayes, in his tables, makes the number of living species thirteen. Mr. G. B. Sowerby ('Zool. Proc.,' 1832) describes twenty-two new species from the collection of Mr. Cuming, most of them from the warm latitudes of the Pacific side of South America. One of them, *C. uniplicata*, dredged in sand near Panama at a depth of ten fathoms, is the only species known to Mr. Sowerby with a single fold on the columella.

Example, *Cancellaria reticulata*. Locality, Southern Atlantic Ocean (Lamarck).



Cancellaria reticulata.

Fossil Cancellariæ.

Lamarck records seven fossil species. Rang says there are a good number. De Blainville observes that, according to Defrance, there are twenty species, two of which are identical, one from Italy, the other from Grignon, and one analogue from Italy. Deshayes makes the number of fossil (tertiary) species forty-two, one of which he notes as both living and fossil (tertiary). Mr. Lea describes and figures, in addition, eight species from the tertiary formation of Alabama (Claiborne). He observes that the genus has been observed in England only in the London clay, from whence three species have been described; and, referring to Deshayes' Tables and his forty-two species, remarks that sixteen are from the Subapennines (Pliocene), twelve from

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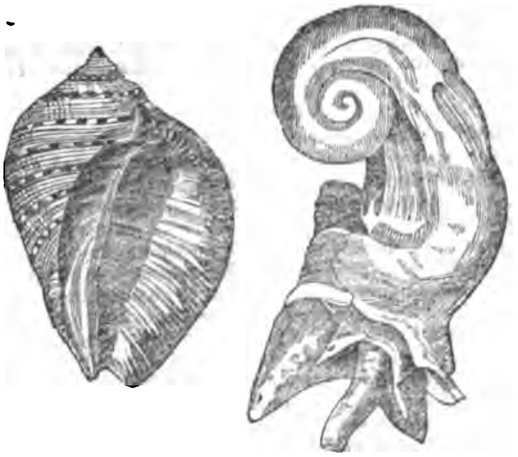
[*] Mr. R. Stutchbury distinguishes *Cassides rufa*, *testiculus*, and *coarctata*, &c. generically under the name of *Cypræocassis*, which, he says, has no operculum. Mr. G. B. Sowerby objects to this genus.

Bourdeaux (Miocene), and five from Paris (Eocene). In America, he observes, a single species only, *C. lunata* (Conrad), had been theretofore observed. It was from the tertiary beds of Saint Mary's.

Purpura.

Animal rather elongated, widened in front; head large with a very short proboscis; two tentacula, generally in front and approximated, conical, and supporting the eyes on an enlargement situated at the middle of their external part; mouth below, nearly always hidden by the foot, which is rather large, very much advanced and bilobated, as it were, anteriorly; branchial pectinations two, unequal; orifice of the oviduct at the entrance of the branchial cavity on the right side; orifice of the deferent canal at the right side of the neck, at the extremity of the exciting organ, which is generally voluminous; vent on the same side.



Shell of Purpura Persica, and animal of Purpura hæmostoma.

Shell oval, thick, unarmed or tubercular, with a short spire, the last whorl larger than all the others together; aperture very much dilated, of an oval form, terminated anteriorly by an oblique notch; columella flattened, finishing in a point anteriorly; right lip sharp-edged, often thickened and furrowed internally, or strongly armed anteriorly with a conical point. *Operculum* horny, demicircular, the summit posterior.

Geographical Distribution.—The form is widely distributed, but the number of European species is very small; the greatest development takes place in warm seas where the species are most abundant, particularly in South America.

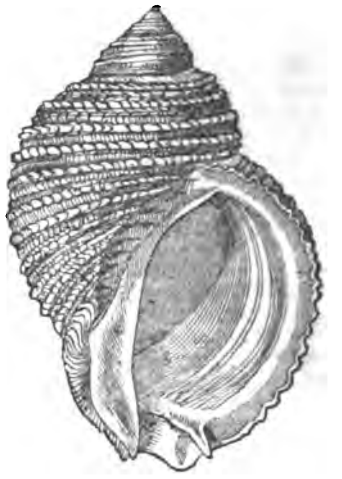
Habits.—The larger proportion of the species of this genus are littoral. The true *Purpuræ* have been found at depths ranging from the surface to twenty-five fathoms, and the division which forms the genus *Monoceros*, generally on rocks, at depths ranging from the surface to seven fathoms.

De Blainville states that there are fifty living species of ordinary *Purpuræ*, of which four only belong to the French seas. The species of *Monoceros*, he states, to be five; all from South America. Deshayes, in his tables, gives seventy-six as the number of living species of the genus *Purpura* (Lam.), and six as that of the living species of *Monoceros*. Mr. Lea states that his cabinet has nine. We are not sure whether M. Deshayes includes among his seventy-six species *P. granatina*, *P. squamigera*, and *P. squamosa*, described by him. Mr. Broderip describes two new species, and Mr. Powys one, from Mr. Cuming's collection (Port St. Elena, Valparaiso, and Maldon Island, in the Pacific), and Mr. Broderip another, *Purpura Gravesii*, figured under the name of *Murex cariniferus*, in Mr. Sowerby's Conchological Illustrations. (*Zool. Proc.*) Mr. Sowerby describes nine species of *Monoceros*, among them, *M. punctulatum* (Gray), from Mr. Cuming's collection.

De Blainville divides the species into four sections:—1st. Those whose right lip, near the notch, is armed with a conical horn, or tooth, which is pointed, and more or less curved. This section is the genus *Monoceros* (De Montfort), the animal of which, according to M. Rang and others, differs in nothing from that of the other *Purpuræ*. 2nd. The *Buccinöid Purpuræ*, whose lip is without a tooth, and whose aperture is moderately widened. *Purpura Lapillus* (Buccinum Lapillus, Linn.) for example. (See above, Buccinum.) 3rd. The *Patulous Purpuræ* also without a tooth at the lip, and whose aperture is very wide; *Purpura Persica*, for instance. 4th. The ventricose tuberculated species of which he gives *P. neritöides* as the type. M. Rang divides the species into two groups only. The first, consisting of those which have the right lip simple, or only furrowed internally: the second, of those whose right lip is always thickened and armed anteriorly with a conical point.

Example of the first, *Purpura Persica*. Locality, East Indian Seas.

Example of the second, *Purpura imbricata* (*Monoceros imbricatum*, Lam.). Locality, South America.



Purpura imbricata, Monoceros imbricatum.

Fossil Purpuræ.

De Blainville states (Malacologie) that no fossil species of *Monoceros* were then known. Deshayes, in his tables, records one (tertiary) from Italy. Mr. Lea describes and figures three new fossil species from the tertiary of Claiborne, Alabama (Eocene of Lyell). Of the ordinary *Purpuræ*, De Blainville states that there are nine fossil species, one of which is the analogue of *P. Lapillus* (*Buccinum Lapillus*, Linn.), so common on our coasts, as well as those of France. Deshayes, in his tables, gives the number of fossil (tertiary) species as four, of which he records one, *P. hæmastoma*, as both living and fossil.

* * * *

Patelloïd Entomostoma; that is, one whose shell is very large in its totality, very flattened, with a spire but little marked, and without a columella.

Concholepas.

De Blainville speaks of the *animal* as entirely unknown, but according to Lesson, it resembles that of *Purpura*. *Shell* thick, rude, and wrinkled transversely on its external surface; spire very small, hardly projecting; aperture oval, very large, notched anteriorly, where there are two dentiform appendages; no columella; muscular impression of a horse-shoe shape, and very visible. *Operculum* horny, transparent, trapezöidal, concentric, with a marginal summit.

Geographical Distribution.—South America is the locality of Concholepas. It is very abundant on the coasts of Peru and Chile, and sometimes attains to a very large size.

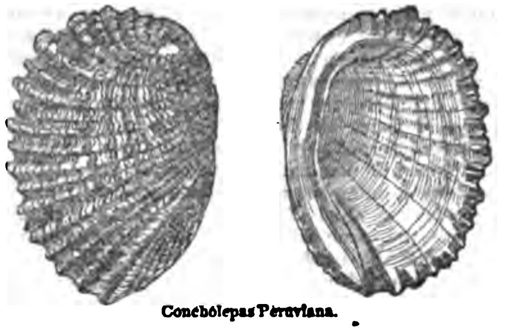
Habits.—Concholepas is, as yet, only known as a littoral species.

Lamarck first placed *Concholepas* near *Purpura*. Cuvier gives it very nearly the same position. M. Rang remarks that he might have well united the genus to *Purpura*, after the example of De Férussac. In fact, he adds, M. Lesson's communication touching the animal which the latter brought home from the South Sea had proved to M. Rang that it differs in nothing from that of *Purpura*; its operculum alone affords a well-defined character.

There is but one species known; but M. Rang states that there are two distinct varieties.

Example, *Concholepas Peruviana*.

Concholepas is not known in a fossil state, properly so called. It occurs among other species of the coast, at considerable elevations above the sea.



Conchŏlepas Pĕruviana.

ENTOMO'STRACA (Müller). Shell Insects; for such is the meaning of the term applied to certain aquatic animals forming, according to Latreille and others, the second general division of the crustaceans, and for the most part inhabiting the fresh water. The brain, or rather the nervous knots which supply its place, consists of one or two globules merely. The heart is in the form of a long vessel. The branchiæ, composed of hair-like processes, which are either isolated, or connected in a beard-like form, a pectinated shape, or one resembling aigrettes, form a portion of the feet, or of a certain number among them, and sometimes mandibles and the upper jaws. [CYPRIS, vol. v. p. 341.] Hence the term BRANCHIOPODA. [See the title, vol. v. p. 338.] The number of the feet varies, and in some of the genera is above a hundred. These feet, ordinarily, are proper for no purpose but swimming; and are sometimes ramified or divided, and sometimes furnished with pinnules, or composed of lamellar joints. Nearly all of them have a shell, consisting of from one to two pieces, very delicate, and most frequently almost membranous and transparent, or at least a large anterior thoracic segment, often confounded with the head and appearing to replace the shell. The integuments are generally rather horny than calcareous, a condition which, as Latreille remarks, approximates the Entomostracans to the Insects and Arachnids. In those which are provided with ordinary jaws, the inferior or external ones are always uncovered, all the jaw-feet (pieds-mâchoires) performing the office of true feet, and none of them being applied upon the mouth. The second jaws, with the exception of the *Phyllopoda*, resemble those organs, and Jurine has sometimes designated them under the name of hands. These characters, says Latreille, distinguish the masticating *Entomostraca* (Entomostracés Broyeurs) from the *Malacostraca*; the other *Entomostraca* which compose this order *Pœcilopoda* cannot, he says, be confounded with the *Malacostraca*, because they are deprived of organs fit for mastication, or because those parts which appear to perform the office of jaws are not collected anteriorly and preceded by a labrum as in the true *crustacea* and the masticating insects (insectes broyeurs), but simply formed by the haunches of the locomotive organs, and furnished, for the purpose of enabling them to execute that office, with small spines. The *Pœcilopoda*, he observes, represent in this class those of the class of insects which are denominated suctorial (suceurs). They are almost all parasites, and seem to lead us by degrees (par nuances) or shades of difference to the *Lernææ*; but the presence of eyes, the property of moulting or changing the skin, or even of undergoing a metamorphosis, and the faculty of being able to transport themselves from one place to another by means of feet, appear to Latreille to establish a well-defined line of demarcation between the animals last named and the preceding. With regard to the metamorphosis, he remarks, that the young of the *Daphniæ* and of some other nearly allied genera, those probably also of *Cypris* and of *Cytherina*, differ not at all or scarcely at all from their parents, in point of form, at the time of their exclusion from the egg; but the young of *Cyclops*, of the *Phyllopoda*, and of *Argulus*, undergo in their infancy remarkable changes, as well in the form of the body, as in the number of feet. These organs, indeed, in some (in the *Arguli* for instance) suffer transformations which modify their uses. The same author states that he has consulted, relative to these transformations, several well-informed naturalists, who have had frequent occasion to observe the *Lernææ*, and that those observers had never seen a *Lernæa* change its skin. The antennæ of the *Entomostraca*, the form and number of which vary much, serve in many for swimming. The eyes are very rarely placed upon a pedicle, and when they are so placed, the pedicle is no more than a lateral prolongation of the head, and is never articulated at its base. The last-named organs are often very much approximated, and even compose one only. The tail is never terminated by a fan-shaped fin, and never presents the false feet of the *Malacostraca*. The eggs are collected under the back, or external, and under a common envelope, having the form of one or two small groups situated at the base of the tail. They possess the power of preserving their vitality for a long time in a state of desiccation. [BINOCULUS, vol. iv. p. 410.] It would appear that not less than three moults are undergone by many of these animals before they become adult and capable of propagating their species, and it has been proved, in the case of some of them, that a single copulation will fecundate many successive generations. [BRANCHIOPODA, vol. v. p. 342.]

In M. Latreille's second method, the *Entomostraca* were treated as a sub-class, with the following characters:—Mandibles naked or none; mouth formed of two rows of pieces; antennæ and feet of a branchial form; tarsi without a horny nail at the end; shell clypeaceous or shield-like, univalve or bivalve, or with annular horny or membranous segments of the body; eyes sessile, often united so as to form one.

1st SECTION. (*Operculés*, shell univalve or bivalve.)

*

Shell univalve. (*Clypeacés.*)
1st order, *Xyphosures*. (Example, Limulus.)
2nd order, *Pneumonures*. (Ex. Ozolus.)
3rd order, *Phyllopodes*. (Ex. Apus.)

*

Shell bivalve. (*Ostrachodes.*)
4th order, *Ostrachodes*. (Ex. Cypris.)

2nd SECTION. (*Nues*, body annulated throughout its length.)
5th order, *Pseudopodes*. (Ex. Cyclops.)
6th order, *Cephalotes*. (Ex. Polyphemus.)

In the last edition of Cuvier's 'Règne Animal' M. Latreille divides the *Entomostraca* into two orders.

I. BRANCHIOPODA. (See that title, vol. v., p. 338.)
II. PŒCILOPODA.[*]

The PŒCILOPODA he divides into two families.

1st. *Xyphosura.*

This family consists but of one genus, vis., *Limulus*.

2nd. *Siphonostoma.*

This family he separates into two tribes.

1. Caligides.

This tribe contains the genera *Argulus*, *Caligus*, and its sub-genera *Pandarus*, *Dinemoura*, &c., and *Cecrops*.

2. Lernæiformes.

This tribe consists of *Dichelestium* and *Nicothoë*.

M. Milne Edwards remarks, that at the first glance the branchial feet of *Apus* and of many other *Entomostraca* would appear to have hardly anything in common with the ambulatory feet or buccal members of the Decapods; but, nevertheless, the same parts are found among the former. In fact, he observes, in the great foliaceous laminæ or blades, the structure of which seems as complicated as it is anomalous, the analogues of the flagrum (fouet), palp, and stem (tige) are easily traced. The first of these appendages constitutes the flattened vesicle which occupies the basilary and external part of the foot: its form is the same as among the *Stomapods*, and its structure further confirms the approximation.

The last-named author proposes the following method, differing from that of Latreille not only in the number of the orders under which the different *Crustacea* are arranged, but also in the limits assigned to many of those divisions:—

A

Mouth deprived of special organs of mastication.

Orders.

Xyphosures.
Siphonostomes.

B

Mouth armed with special organs of mastication, viz., with one pair of mandibles, and with one or more pairs of jaws.

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[*] The reader will find those Pœcilopoda, which are not already noticed in this work, either under that title, or under their generic names.

Orders.
Ostrapodes.
Cladocères.
Phyllopodes.
Copépodes.
Læmipodes.
Isopodes.
Amphipodes.
Stomapodes.
Decapodes.

M. Milne Edwards further states that Latreille, a little before his death, was again occupied with the subject, and introduced into his method many modifications, which made it approach nearly to that proposed by M. Milne Edwards. The latter says that Latreille in fact admitted into the class *Crustacea* 12 orders, viz., the *Decapods*, the *Stomapods*, the *Læmipods*, the *Amphipods*, the *Isopods*, the *Dicladopods*, the *Lophyropes*, the *Ostrapods*, the *Xyphosures*, and the *Siphonostomes;* and that the *Dicladopods* very nearly correspond to the *Copepods* of M. Milne Edwards. The last-named author, when speaking of Latreille's classification in the first edition of the 'Règne Animal,' speaks of Latreille's not attaching to the distinction of *Malacostraca* and *Entomostraca* an importance which those divisions do not deserve; but M. Milne Edwards still retains the term *Entomostraca;* for we find in his synoptical table (*Histoire Naturelle des Crustacés—Suites à Buffon*), under the subclass of *Maxillated Crustaceans*, the legion of *Branchiopods*, containing the orders *Ostrapoda* and *Phyllopoda*, and the legion of *Entomostraca*, consisting of the orders *Copepoda* and *Cladocera*.

The reader who wishes to study the classification, economy, and anatomy of the Entomostraca, should more particularly consult, besides the works above alluded to, those of Swammerdam, Needham, Leuwenhoek, De Geer, Ramdhor, Schoeffer, Straus, Hermann, the younger Fabricius, the Jurines, father and son, Adolphe Brongniart, Slabber, Desmarest, De Blainville, Thompson, and Audouin.

ENTOZO'A (from the Greek words *entos* (ἐντὸς), within, and *zôon* (ζῷον) an animal). Under this name are designated the different living beings which are produced and developed within other living beings. It comprehends a series of animals differing greatly from one another in form and organization, and having but one character in common; which is, that they are all parasitic, or have their exclusive habitation in, and live at the expense of the bodies of other animals. They can scarcely be said to form a distinct class in the animal kingdom, some of the species being closely resembled both in external appearances and internal structure, by individuals placed in other classes, and only differing from them in the localities where they are found; thus the zoosperms, or seminal animalcules, which are enumerated by some zoologists with the entozoa, closely resemble the true cercariæ of vegetable infusions.

Entozoa are found in most animals; they have been discovered in all the mammalia from man down to the cetacea; they also occur in the other classes of the vertebrata; indeed, it seems that a greater number reside in birds, reptiles, and fishes than in mammals. The invertebrata have also their peculiar parasites; and they have been ascertained to exist in all the insect tribes, and in beings still lower in the scale. The best known species are those which inhabit the intestines of the human subject, and vulgarly go by the denomination of worms, which term was probably derived from the resemblance which the *Ascaris lumbricoïdes* bears to the common earth-worm, as this species is most frequently met with, and was the first described of the human entozoa, being mentioned by Hippocrates, who called it the ἕλμινς στρογγύλος, or round worm.

A short list of the different kinds of worms found in the human intestinal canal, with an enumeration of their causes, the morbid symptoms which they occasion, and the mode of treatment, are given under the article ANTHELMINTICS.

With regard to the causes of the formation, or the primary origin of the entozoa, nothing is known; and the whole subject is entirely involved in darkness; they must either be supposed to be the product of spontaneous generation, or the germs of them are introduced from without. Many arguments have been adduced on both sides of the question, but as the discussion would lead to no useful results, we shall leave it untouched, and proceed to give a short sketch of these curious and interesting animals.

According to the derivation of the word *Entozoa*, and the definition which we have given of it, this term should include every living creature found in the body of another (which has not been introduced from without): therefore the small microscopic animalcules detected in the semen of animals, called *Spermatozoa*, come under this head; and in a very able paper on the entozoa by Mr. Owen, we find them placed accordingly in this class, only situated in a separate group, denominated *Protelmintha*, and divided from the animals forming the class entozoa of Rudolphi. These minute beings, which, from their size and organization, rank with the assemblage of animalcules which are collected under the head Infusoria in the 'Règne Animal,' have been detected in the secretion of the testicles of various mammiferous animals arrived at maturity. When a drop of the secretion is expressed from a divided vas deferens shortly after death, and examined with a microscope, after being diluted with water, it is seen to be filled with minute beings resembling tadpoles, and swimming about in various directions, with different degrees of velocity, guided by the inflection of a slender tail. It has been doubted whether these are animated beings at all, or are to be considered as analogous to the moving filaments of the pollen of plants; but leaving this undecided, we may proceed to state that the body is always of a compressed form, which will distinguish these animalcules from the vegetable infusoria, in which the body is always ovoid or rounded. With regard to their organization, no alimentary canal or gastric cavities have been detected, nor organs of generation; they are said to be fissiparous, the body and tail spontaneously dividing, and forming two independent beings. The shape of these zoosperms differs in different animals, the head end, or body, being bigger in proportion to the tail in some than in others, and their size not being always in relation to that of the animal to which they belong: thus those of the rabbit are nearly as large as those from the bull. That these animalcules perform some office in the economy of nature seems probable from the fact that in those animals which are subject to periodical sexual development, as the hedgehog and mole (in which the testes undergo an alteration in size in different seasons), these creatures are not found during the period of quiescence, or partial atrophy of the glands; neither do they exist in the seminal passages before the age of puberty. But the part in the physiology of generation which these zoosperms perform is not so … The *spermatozoa* have been detected in the other orders of the vertebrate and in the articulate animals.

In the present group are also included those minute internal parasites which have been detected in the bodies of many of the entozoa themselves, and which, from their external form, are referrible to the infusoria.

The Trichina Spiralis, an entozoon, found inhabiting the muscles of the human subject, has been placed by Mr. Owen, who first described it, with the preceding animalcules; but further observations on its organization have discovered a complexity of structure which qualifies it to occupy a place in the highest instead of the lowest group into which the present class of animals is divided.

We now proceed to the more legitimate part of our subject, viz. the true parasites forming the class *Entozoa* of Rudolphi, and it is first necessary to arrange them according to some classification. Availing himself of the difference in their internal organization, Cuvier divided them into the 'cavitaires,' or those which have an abdominal cavity, and a distinct intestinal canal within it, and the 'parenchymateux,' or those in which no intestinal tube is traceable, and which for the most part consist throughout of an homogeneous structure; but this classification is anything but a natural one, as worms the most dissimilar in their general appearance are here promiscuously congregated together. Mr. Owen, in the article which we have alluded to (in the *Cyclopæd. of Anat.*), has adopted the arrangement of Cuvier, only inventing new Latin terms derived from the Greek, instead of the French terms: he denominates the 'parenchymateux' 'sterelmintha,' from *elmins*, 'a worm,' and *stereos*, 'solid;' and the cavitaires 'cœlelmintha,' from *elmins*, and *cœlos*, 'hollow.' … laid the first foundation of a good classification of these animals, dividing them into five classes, afterwards … families, at Rudolphi's suggestion; and these were subdivided into genera and species. Rudolphi … doubted the possibility of ever reducing all the … of entozoa to absolutely natural and well-defined …

but as Zeder's system seemed the most perfect, he has adopted it for his own; and it does not seem that we can do better than follow the arrangement of this great entozoologist in the present article.

According to this classification the entozoa are divided into five orders, or families, the Nematoidea, Acanthocephala, Trematoda, Cestoidea, and Cystica. The only point in which we shall depart from this arrangement will be, that, instead of commencing with the most perfect, and descending to the most simple, we shall begin with the lowest in the scale of organization, and ascend to those possessing the most complicated structure, as this is most in accordance with the laws of the animal kingdom.

Order I. is *Cystica* (from *cystis* (κύστις) a bladder) hydatids: the characters are:—body flattish, or roundish, and terminating posteriorly in a transparent cyst filled with pellucid fluid, which is sometimes common to many individuals; the head is retractile, and provided with pits two or four in number, or four suckers and a circle of booklets, or with four unarmed or uncinated tentacles. The organs of generation and nutrition are unknown. This is not a very natural family, the species being closely allied to those of the next order in the structure of the heads and the *Ecchinococcus*, or granular hydatid, though referred to it, is not hollow.

Order II. *Cestoidea* (from *cestos* (κεστός), 'a band;' and *eidos* (εἶδος), 'form),' tape-worms. Characters:—body elongated, flattened, soft, continuous, or articulated, furnished with lateral or marginal pores, and erectile papillæ passing through them, supposed to be the male organs of generation. Head generally provided with two or four pits, or suctorial orifices, and sometimes with four retractile, unarmed, or uncinated tentacles; but the head is so dissimilar in different genera, and their shape varies so much, that they do not form a very natural family. There is no trace of intestinal canal, unless the vessels proceeding from the suckers be considered as such. In some species nutrient vessels and ovaries are to be seen. They are all androgynous.

Order III. *Trematoda* (from *trema* (τρῆμα), 'a foramen'), fluke-worms. Characters:—body soft, rounded, or flattened. Head indistinct, with a suctorial foramen; one or more suctorial pores on the under surface of the body, which furnish the grounds for their subdivision into genera: they have no intestinal canal, and the organs of generation of the two sexes co-exist in the same individual: this is a very natural order.

Order IV. *Acanthocephala* (from *acantha* (ἄκανθα), 'a thorn;' and *cephale* (κεφαλή), 'the head),' hooked-worms. Characters:—body elongated, round, subelastic; the anterior extremity or head has a retractile proboscis, furnished with hooks or spicula, arranged in rows. They have no intestinal canal, but distinct genital organs, and a separation of the sexes. This is a very natural group, and includes the most noxious of the internal parasites: there is only one genus, and fortunately no species is known to infect the human body.

Order V. *Nematoidea* (from *nema* (νῆμα), 'a thread,' and *eidos*, 'form'), round-worms. Characters:—body cylindrical, elongated, and elastic; structure very complicated, there being a true intestinal canal, terminated by a distinct anus. The mouth, by its varieties, affords generic characters; the sexes are distinct; the females, which are larger than the males, being for the most part oviparous: they constitute a very natural order.

Having given the above brief view of the orders into which the class *Entozoa* is divided, with the leading or characteristic differences in their form and organization, we will now enumerate the principal genera contained in each group, and make a few observations on some of the most interesting species. Following the order of classification, we must commence with the most simple group, the *Cystica*; and here the first parasite which attracts our attention is the common hydatid, which consists of a globular bag, composed of condensed albuminous matter of a laminated texture, and contains a limpid colourless fluid. No head or appendices of any sort being attached to it, it is appropriately denominated an *acephalocyst*, that is, a headless [illegible]. This genus was established by Laennec, who regarded as animals those productions which before his time had been considered simply as cysts. Considerable diversity of opinion exists as to their nature, and it is impossible to determine whether an hydatid is an animal or not, till we can agree what is the definition of an animal; if an animal must have sensation and motion, this is not one, as the best observers agree that the acephalocyst is impassive under the application of stimuli of any kind, and manifests no contractile power, either partial or general. If an animal is characterized, on the other hand, by independent existence merely, the hydatid is one; and as such we shall regard it, for it is certainly an independent organized being, growing by intrinsic power of imbibition, and reproducing its species by gemmation: the young are developed between the layers of the parent cyst, and thrown off internally or externally, according to the species. It is a being certainly far inferior in the scale to the Cysticercus, but still not the less an independent creature. Its structure is very similar to that of some of the lowest forms of algæ in the vegetable kingdom, as the *protococcus nivalis* or red snow of the arctic regions, which consists of simple and minute vesicles, which propagate their kind by gemmules developed from the external surface of the parent. Acephalocysts have been found in almost every structure and cavity of the human body, but particularly in the liver, uterus, kidneys, and cellular tissue. The species which resides in man is called *A. endogena*, the pill-box hydatid of Hunter, from the gemmules being detached from the internal surface of the cyst; and it is thus distinguished from those of the ox and other ruminating animals, which are exogenous, or have the gemmules excluded from the external surface.

2. The next genus is *Echinococcus*, which, as the name implies, is a round body covered with asperities. The *E. hominis*, or many-headed hydatid of the Germans, occurs in cysts in the liver, spleen, omentum, and mesentery; the cyst, which is externally yellow and coriaceous, is unprovided with head or mouth, and contains minute bodies, which are described as possessing the armed and suctorious head characteristic of the Cœnuri and Cysticerci. From observations made on another species, the *E. veterinorum*, found in animals, the particles adhering to the internal surface of the cyst being examined with a microscope, appeared to be minute animalcules, moving about by means of external vibratile cilia, having an orifice at each extremity of the body, and the centre occupied by large globular stomachs. From this structure these parasites ought to be classed with the Polygastric Infusoria.

3. *Anthocephalus* is the next genus. It occurs in fish, in the liver, mesentery, and peritoneum, and within hydatids in the viscera. Each animal exists solitarily in a double bladder, of which the outer layer is hard and elastic, the inner more thin and delicate. The body is long, flat, terminated behind by a caudal vesicle, and in front by a head with two or four fossæ, and four proboscides furnished with spicular processes.

4. *Cœnurus*. This has the terminal cyst common to many bodies and heads; the former are elongated, flattish, and wrinkled; the latter are furnished with a rostrum, on which there are hooks and suckers, adhering in greater or less number to the surface of a bladder filled with fluid. The best known species is the Cœnurus cerebralis, commonly developed in the brain of sheep, and giving rise to the disease called the staggers.

5. *Cysticercus*. Here there is a dilated cyst forming the termination of a single entozoon; the head has four suckers, and a rostrum furnished with recurved processes or hooks. Of this genus one species is known to infest the human subject, the *C. cellulosæ*; it is developed in the interfascicular cellular tissue of the muscles, and is invariably surrounded by an adventitious capsule of condensed surrounding substance. This entozoon occurs much more rarely in this country than on the continent; it is not confined to the muscular structures, for several individuals have been detected in the anterior chamber of the eye, where they may occasion so much irritation and inflammation of the organ as to require extraction, which occurred in a recent case in the Glasgow Ophthalmic Infirmary. These parasites also occur in quadrupeds, particularly the hog, giving rise to that state of the muscles which is called 'measly pork.'

Of the *Cestoid* order of Entozoa, Rudolphi has described eight genera, two only of which contain each a single species that infest the human body:

1. *Bothriocephalus*, the species of which occur frequently in fishes and birds, in the branchiæ, œsophagus, pyloric appendices, intestines, and abdominal cavity. The one which affects the human subject, B. latus, or Tænia lata, rarely falls under the observation of the English entozoologist, but is common in the intestines of man in Switzerland, Russia, parts of France, &c. It may be distinguished from the

Tænia solium by the form of the segments, which are broader than they are long, and by the position of the genital pores, which are on the under surface of the body, instead of at the sides; the head is also very different, for, instead of having four round oscula, characteristic of the true tæniæ, there are two lateral longitudinal fossæ, or bothria.

2. *Tænia.* This genus has the body flat, long, articulated, with four suckers on the head; it occurs in the intestines, biliary ducts, gall-bladder, and liver of vertebrate animals. The T. solium, common tape-worm, inhabits the human intestines, but not with equal frequency in all countries, though its distribution seems to be much more extensive than that of the Bothriocephalus latus. It occurs in England, Holland, Germany, Sweden, Italy, Greece, and most countries in Europe, and also in Egypt and the East; and in all these situations the other genus is comparatively rare.

The delicacy of their structure, and their so seldom being obtained entire, has thrown great obstacles in the way of their investigation. The head was for a long while unknown, and it was disputed whether nourishment was taken in by the lateral pores of the several joints, or by the mouth alone. Rudolphi says the latter, and it seems now pretty clearly determined that the former are mere outlets of the generative organs. The length to which the T. solium is capable of attaining is very considerable, but quite indefinite. Those passed now-a-days seldom exceed twenty feet, but in former times we read of much more gigantic specimens; but whatever may be thought of some of the accounts which are quite improbable, it indubitably has occasionally attained a very great length, having been found extending from the pylorus to within a few inches of the anus, and then by no means fully stretched out. Such cases are however very rare.

The determination of the species in this genus is very difficult: they may be divided for greater convenience into three sections: The first are without a proboscis, the *Tæniæ inermes;* the second have one, but unarmed, *T. rostellatæ;* the third are furnished with an uncinated proboscis, *T. armatæ.*

3. *Caryophyllæus* has the body flat, continuous; the head dilated, and divided into flattish processes; it is furnished with an upper and under lip; the species of this genus occur in the intestines of fishes (carp, &c.).

4. *Scolex.* The body is flat and continuous; the head has four fossæ on it; it occurs also in the intestines and abdomen of fishes, sepiæ, &c.

5. *Gymnorhynchus.* This genus has the body very long, with a globular receptacle at the neck; head with two opposite fossæ, and four naked retractile probosces; the species occur in the muscular substance of many fish.

6. *Tetrarhynchus.* Body flat, continuous, head with four fossæ and four retractile probosces, furnished with recurvated spicular processes; it occurs in reptiles, fishes, molluscæ, in the muscles, branchiæ, stomach and its membranes, the liver, and peritoneum.

7. *Ligula.* In its first stage of development the body is elongated with a longitudinal fissure, without any appearance of head, or organs of generation. In its perfect state there is a simple fossa on each side of the head, and the ovaries and processes form a single or double row along the median line. The species occur very frequently in birds and fishes, but very rarely in mammalia.

8. *Triænophorus* has the body elongated, flat, sub-articulated, mouth bilabiate, and furnished on each side with two tricuspid acicular processes; it is found in fishes.

The *Trematode* order is divided into six genera, which also include only two species infesting the human body.

1. The first genus is *Monostoma,* which has only a single anterior pore: it occurs in mammalia, birds, reptiles, and fishes.

2. *Amphistoma* is furnished with two pores, one anterior and one posterior. Found in the stomach, intestines, and abdomen, and in the hydatids of the viscera of mammals, birds, and reptiles.

3. *Distoma.* In this genus there are two pores: an anterior and a ventral. An immense number of species are known, occurring in mammalia, birds, fishes, &c. The D. hepaticum, or fluke-worm, frequents the gall-bladder and ducts very frequently in some animals, as the ruminating, and is particularly common in the sheep in the disease called t. It has been discovered in the gall-bladder of the n subject, though very rarely. It bears a considerable resemblance in its shape to a melon-seed, being flat, and appearing lanceolate at each end, as seen with the naked eye, though, when magnified, the extremities are found to be obtuse, the tail being the broader of the two. The anterior pore, or true mouth, is round and small; the posterior cavity is imperforate, and only subservient to adhesion and locomotion; it is situated in the ventral aspect of the body, in the anterior half. Between these there is a third orifice, destined to the generative system, and from which a small cylindrical process is generally protruded. The fluke is hermaphrodite and oviparous: it lives upon the bile, which is absorbed by the mouth, and is at once so digested or modified by the vessels which go off from thence, as to become immediately fitting nourishment for the animal.

4. *Tristoma* has three pores, the anterior simple, and the posterior radiated: it is found in the gills of one or two species of fish.

5. *Pentastoma.* The mouth is here situated between two pores on each side, through which a spicular process comes out. It occurs in the frontal sinuses, lungs, and surface of the liver of the mammalia (dog, horse, wolf), and in reptiles.

6. *Polystoma.* This genus has six anterior pores, besides a ventral and posterior one. It mostly occurs in the throat and branchiæ of fishes, and the bladder of frogs; but one species, the *P. pinguicola,* was discovered by Treutler in the cavity of an indurated adipose tubercle, in the left ovarium of a female aged 20, who had died in child-bed. The tumour, which was apparently formed entirely of incurated fat, was of a reddish colour and hollow within; the cavity was nearly filled by the above-named worm, which was about half-an-inch in length, and between one and two lines in width.

The 4th order, *Acanthocephala,* contains but one genus, *Echinorhyncus,* to which belong numerous species occurring in all classes of vertebrate animals except man: they are generally found in the intestinal canal, fixed between its membranes, and occasionally even in the peritoneal cavity; they have also been found in the neck under the skin.

We now come to the last and most highly organized group of the entozoa, the *Nematoidea,* which contains a greater number of genera, and includes more species inhabiting the human body than any of the preceding. It has been divided into 11 genera, viz.

1. *Filaria;* these are of nearly equal thickness throughout their whole length; they occur in all parts of the vertebrata, though principally in the cellular membrane; they are also even found in insects and their larvæ.

2. *Trichosoma.* On its anterior extremity, which is very thin, is the mouth, resembling a minute point: it is found in mammalia, birds, and amphibia, between the coats of the stomach, in the intestines, and the urinary bladder.

3. *Trichocephalus.* This genus differs from Filaria in the capillary form of the anterior part of the body, and in its swelling out behind; it occurs principally in the cæcum of the mammalia.

4. *Oxyuris* is characterized by being subulate posteriorly, having the mouth orbicular, and the penis in a sheath. The Ascaris vermicularis is included in this genus by Bremser.

5. *Cucullanus* is attenuated posteriorly. It occurs in the intestines and abdomen of reptiles and fishes.

6. *Spiroptera* is attenuated at each end. It occurs under the nictitating membrane of birds, in various parts of fish, and is said to have been found in the urinary bladder of man.

7. *Physaloptera* is attenuated at both extremities; the tail of the male is bent downwards, winged, and furnished below with a sort of bladder. The species are found in the stomach of mammalia, birds, and reptiles.

8. *Strongylus.* This has both ends attenuated: the tail of the male terminates in what Rudolphi calls a bursa, and through this the penis passes out; it occurs frequently in various situations in the three first classes of vertebral animals.

9. *Ascaris.* This genus, which is the most numerous of the intestinal worms, 80 species having been already described, has the extremities attenuated, the mouth furnished with three valves or tubercles, and the penis double. The species occur in almost every part of the bodies of vertebral animals.

10. *Ophiostoma* is attenuated at the extremities, and has the mouth furnished with two lips. It is found in the intestines of mammalia and fishes.

31. *Liorhynchus* has the mouth at the end of a sort of muscle and polished tube. It occurs in the stomach and intestines of some of the mammalia and of many fishes.

In the above list of the genera of the cavitary, intestinal, or round worms, we have not made any particular mention of the species parasitic in man; and as several of them possess considerable interest, we need no apology for giving a short description of them. We may begin with the genus *Filaria*, three species of which are enumerated as human inhabitants, though two of them have been only once detected. The *Guinea Worm* (*Filaria Medinensis*) frequently occurs in hot climates, but the countries where it most abounds are Arabia, Upper Egypt, Abyssinia, and Guinea. Its general habitation is the subcutaneous cellular tissue, particularly of the lower extremities; but it is also found in the scrotum, and very rarely beneath the tunica conjunctiva of the eye. The length of this worm varies from six inches to twelve feet: it is about as thick as the string of a violin. Its colour is generally white, but occasionally brown; it is round, and of nearly equal dimensions in its whole length, but becomes a little attenuated towards the anterior extremity. The tail of the male is obtuse, and armed with a spiculum; in the female it is acute and hooked. The mode of development of this entozoon is unknown. It seems that it may exist for many months without being detected, cases occurring where it has not been discovered till more than a twelvemonth after leaving the country where it was contracted. After a time it produces irritation; in some point of the skin a vesicle, pustule, or small abscess forms, breaks, and then the end of the worm makes its appearance, which may be taken hold of, and cautiously and gradually extracted. If the filaria is broken, the portion remaining beneath the skin dies, and produces inflammation, sinuous abscesses, and often great constitutional disturbance, requiring amputation of the limb. It seems to be capable of slowly shifting its situation in the cellular membrane. According to Rudolphi, its coming out through the skin is not to be attributed to perforation of that membrane, which it is not at all capable of effecting, but only to the irritation which it excites in approaching the integuments. It seems sometimes to affect people within the tropics in an endemic or even epidemic form, nearly half the men in a regiment having been attacked at the same time by it. This species has been mentioned as having been found occasionally beneath the conjunctiva of the eye; but another, and much smaller kind, has been detected within the eyeball itself, viz. the *Filaria oculi humani*, which Nordman met with in the liquor Morgagnii of the capsule of the crystalline lens of a man who had had the operation of extraction for cataract performed. Two minute worms were discovered rolled up together. This species differs from the large Filaria found in the eye of the horse. The third species is the *F. bronchialis*, which was once detected in the enlarged bronchial glands of a man by Treutler; its length was about an inch. The *Trichocephalus dispar*, or long thread worm, is about an inch and a half or two inches in length, the male being smaller than the female. The capillary portion makes about two-thirds of the whole length of this species. This worm is very common in the cæcum and large intestines, but does not seem to occasion any inconvenience, though inflammation of the intestinal follicles and fever has been erroneously ascribed to it. The existence and history of the following entozoon are involved in a good deal of mystery. *Spiroptera hominis* is the name given to some small intestinal worms which were sent to Rudolphi, together with some other vermiform bodies of an elongated form and solid homogeneous texture, which were passed from the bladder of a poor woman still living in St. Sepulchre's work-house, London. There were also discharged, together with these substances, numerous small granular bodies, considered by Rudolphi as mere morbid concretions, but which subsequent examinations have caused to be regarded as ova. The small nematoid worms, which were six in number, and of different sizes, are supposed to have been expelled from the woman at the same time; they were from eight to ten lines in length, slender, white, and elastic; the other elongated bodies varied in length from four to eight inches. Some of the latter substances and ova are preserved in the Museum of the College of Surgeons; but none of the former entozoa, denominated *Spiroptera hominis*, are to be found among them.

The *Strongylus gigas* also inhabits the urinary apparatus. Before Rudolphi's time it was generally confounded with the *Ascaris lumbricoides*, to which it bears some resemblance. It occurs, though rarely, in the substance of the kidneys, where it sometimes attains an enormous size, having been met with three feet long, and half an inch in diameter. The more ordinary dimensions however are about fifteen inches in length and two lines in thickness. The common colour is blood-red, arising from the nature of their food, as they obtain their nourishment from the contents of the renal vessels; they occasionally find their way into the bladder, and are discharged with the urine. This entozoon occurs much more frequently in some animals, as the dog, horse, &c., than in man. Their presence in the kidneys does not seem to give rise to any peculiar symptoms differing from those of other renal diseases.

The *Ascaris lumbricoides*, the common round worm so frequently met with in children, is so well known as to require a very brief notice here. It occurs in the hog and the ox, as well as in man, and chiefly inhabits the small intestines. The male is smaller than the female, and much more rare; it may be distinguished by the end of the tail being curved, and terminating in an obtuse point, at the apex of which a small black speck may be frequently observed. In the female this extremity is straighter and thicker. The anus is situated close to the tail in both sexes. In the female there is generally a constriction in the centre of the body where the organs of generation are placed. This worm, when minutely examined, will be found to consist of integuments, muscles, digestive organs, genital apparatus, and a nervous system consisting of an œsophageal ring and a dorsal and ventral cord. It has been supposed to feed on the chyle or mucus in the intestines, and to adhere to the walls of the bowels, but on these points there is considerable doubt. They are often found in great numbers.

The last human species in this group is the *Ascaris vermicularis*, the maw-worm, thread-worm, or ascarides. It is very minute, the male seldom exceeding two lines, and the female five lines in length, and being proportionally slender. Their colour is white; they are so small that there is great difficulty in detecting their structure, but Rudolphi says that he has repeatedly observed the three tubercles round the mouth characteristic of the genus. Their abode is the large intestines, particularly the rectum, where they sometimes occur in immense numbers, and occasion great irritation.

We have now enumerated all the genera of *Entozoa* described by Rudolphi and other Entozoologists, but before we conclude our subject we will say a few words on the *Trichina spiralis* which we have before mentioned. It is a microscopic parasite, infesting the muscles of the human subject, belonging to the voluntary class, and found in greater numbers in those that are superficial than the deep seated. Their nidus seems to be in the interfascicular cellular tissue. A portion of muscle affected by these animals appears beset with whitish specks, which, if examined with a microscope, are found to be little cysts containing a minute worm coiled up. The cysts are of an elliptical shape, and attenuated towards the extremities; their length is about $\frac{1}{50}$th of an inch, and breadth $\frac{1}{100}$th. By cutting off one extremity of the cyst, the *trichina* may be extracted entire, when it is generally found rolled up in two or two and a half spiral coils. Being straightened out, it will be found to measure $\frac{1}{30}$th of an inch in length and $\frac{1}{700}$th of an inch in diameter. From the minuteness of the object, it is necessary to employ a magnifying power of considerable intensity to examine it satisfactorily, and from the difficulty of managing the investigation, and the deceptive appearances produced under the microscope, it is not easy to detect its organization. Mr. Owen never succeeded in discovering an intestinal tube, or cavity, and therefore, as we have stated, placed this entozoon in his first group along with the seminal animalcules. (See *Zool. Trans.*, vol. i.; and *Zool. Proceedings*, *Feb.* 1835.) Dr. Arthur Farre observed by very patient and minute observation with the microscope, under favourable circumstances, that it possesses an intestinal canal with distinct parietes, (*Med. Gazette*, *Dec.* 1835), and upon this ground it ought to occupy a higher station among the nematoid or intestinal worms; but further researches are necessary, before it can be stated with confidence in which group this entozoon should be placed. It seems that this parasitical affection of the human body is unconnected with age, sex, or any particular form of disease, and it appears that it may exist without giving rise to any debility of the vital powers, or even without interfering with the enjoyment of robust health, as has been shown in a case lately met with.

All the known parasites residing within the human body have now been mentioned, and we have given a general outline of the groups and genera of the class Entozoa. It would far exceed our limits to attempt to enumerate all the species which have been discovered, and described by authors; which would even then probably include but a small number of those which exist. In fact, if we assent to the theory of their being the product of some irregular process of nutrition or secretion within animal bodies, or, as it is called, spontaneous or equivocal generation (which is perhaps more probable than that they are introduced from without), new and dissimilar species may be formed every day, by some unknown modification of the nutritive process which gives birth to them. The laws which, according to this hypothesis, regulate the difference of structure in these beings, from the simple acephalocyst to the complicated ascaris, are as much involved in obscurity as those which cause the varieties of organization in morbid productions connected with and participating in the life of the rest of the body; for instance, the various classes of tumours.

ENTRE DOURO E MINHO, a province of Portugal, bounded on the north by the river Minho, which separates it from Gallicia in Spain, and on the south by the Douro, which divides it from the province of Beira. From its position between these two rivers the province has derived its name, although it is sometimes also called the province of the Minho, for brevity's sake. To the east it is bounded by the province of Tras Os Montes, and to the west by the Atlantic Ocean. Its length is about 60 miles from north to south, and its breadth is about 40 miles. Its area is, according to Miñano, 240 square leagues, of 20 to 1 degree of latitude, or about 2880 English square miles. Its population, by the same authority, as well as that of Antillon, is about 900,000, which is nearly one-fourth of the whole population of Portugal, it being by far the most thickly inhabited province of that kingdom. It is divided into five comarcas, or districts, namely, Braga, Viana, Penafiel, Guimarães, and Oporto. The principal towns are, Braga, the capital of the northern division of the province [BRAGA]; Porto or Oporto, the capital of the southern division, by far the most important town in it [OPORTO]; Guimarães, on the river Ave, an antient town, once the cradle and the capital of the monarchy, at present an industrious busy place, with manufactures of linen, leather, and cutlery, and 6000 inhabitants; Viana, with 8000 inhabitants, and a harbour at the mouth of the Lima, carrying on a considerable trade; Villa do Conde, with a small harbour, and 3000 inhabitants; Barcelos, with 3900; Valença, on the Minho, a frontier town and fortress, with about 1600 inhabitants; Penafiel, with 2300; Caminha, at the mouth of the Minho, with a harbour, and about 1000 inhabitants; S. João da Foz, at the mouth of the Douro, below Oporto, with 3300 inhabitants; Amarante, on the Tamega, with about 1000 inhabitants. The surface of the province is hilly, but there are some plains near the sea-coast. One ridge of mountains, the Serra de Marão, runs from north to south through the east part of the province, near the borders of Tras Os Montes; the rivers Cavado, Ave, and Neiva have their sources in these mountains. The river Lima, which, next to the Douro and the Minho, is the largest in the country, has its source in the mountains of Gallicia; it enters the province of Entre Douro e Minho at its north-east extremity near Lindoso, runs through the north part of the province, passes by Ponte de Lima, and enters the sea near Viana. The river Tamega, which has its source in Tras Os Montes, flows through the province of Entre Douro e Minho in a southern direction, passes by Amarante and Canavezes, and then enters the Douro.

This province is the most fertile in Portugal, the climate is healthy, and the soil is irrigated by numerous streams. The principal productions are wine, oil, flax, Indian corn, some wheat and oats, and vegetables and fruits of all sorts. Pastures are rather scarce, yet a considerable quantity of cattle, both large and small, are reared. The principal article of exportation is wine, which is made chiefly from the vineyards which are planted all along the valley of the Douro, and which is shipped at Oporto under the name of port-wine. There are fisheries along the coast, which occupy a great number of hands. The natives of Entre Douro e Minho are considered, together with their neighbours of Tras Os Montes, as the finest race of men in Portugal: they are industrious, civil to strangers, and orderly. The province is divided into two administrative divisions, Braga and Oporto, called also Alto Minho and Baixo Minho, each having its military and civil governors and its courts of justice. The division of Alto Minho includes Braga and Viana, and all the northern part of the country from Braga to the Minho; that of Baixo Minho, which is by far the larger, includes Oporto, Guimarães, Penafiel, Amarante, and all the country southwards as far as the Douro.

ENTRESOL, a French term used to signify a floor between other floors. The entresol consists of a low apartment or apartments, usually placed above the first floor. In street architecture it is desirable to form the basement story on a scale of grandeur, and in so doing a greater space than necessary would be given to the first floor, if it were not for the entresol.

There is a very good example of an entresol under the colonnade of the Quadrant in London. In continental cities the entresol is frequently employed, especially in Paris.

The term Mezzaninro (or little middle floor) is used in Italy to indicate the same arrangement of floor, as well as the attic story of a house. The windows of the entresol, or mezzaninro, are usually, from the lowness of the floor, either square, or a little more or less than a square.

ENTRY, from the French *entrée*, and Latin *intrare*, to enter, in law, is a taking possession by the legal owner of lands and tenements when another person is wrongfully in possession of them. At the common law this might be effected by force; but as it was the cause of great abuses, forcible entries were made punishable by fine and imprisonment by two statutes of Richard II., enlarged by a statute of 8 Henry VI. c. 9. (See 1 Ad. and E. 627, and 3 Ad. and E. 817.)

A party availing himself of this summary process against an aggressor must enter upon some part of the property claimed, and the safer course is formally to declare that thereby he takes possession of the whole. The entry must be repeated in each county in which the lands lie. This remedy, however, can only be adopted in certain cases, namely, where the original entry of the holder of the land was by unlawful means.

In other cases, where the original entry is lawful, and possession held by an apparent right, the owner of the estate must proceed by an action, as an apparent right cannot be legally overthrown by the mere act of a claimant.

The Statute of Limitations, 21 James I., c. 16, and the statute 4 and 5 Anne, c. 16, and the more recent enactment 3 and 4 William IV., c. 7, regulate the law on this subject, and also the periods within which entries may be made.

Entry, forcible, is an entry made with a strong hand, with unusual weapons, an unusual number of servants, or with menace of life; if effected with violence, and the entry only amounts in law to a trespass, it is not within the meaning of the statutes of Richard II. above referred to. The remedy for parties aggrieved, and the mode of obtaining restitution, is either by an action at law, by indictment, or by justices of the peace upon the view. If made by more than three persons, they may be proceeded against as in a case of a riot. (Bacon's *Abridgment*; Burn's *Justice*.)

Entry, writ of, was another method of gaining possession of disputed property by trying the title of the occupant. The earliest mention of this writ occurs in the third year of the reign of Edward III. This writ was directed to the sheriff, requiring him to command the tenant that he render to the demandant the premises in question which he claims to be his right and inheritance, &c. The tenant thereupon was either compelled to deliver up the possession of the land, or to show cause why he refused to do so. This might be done by justifying his own title or that of others under whom he claimed. The claims of the respective parties were then tried before a jury, and the possession of the land was awarded to him who produced the clearest evidence of his right.

There were several writs of entry both at the common law and by statute; but they appear to have long fallen into disuse, and but few instances have occurred in modern times of their being resorted to in practice. The learning respecting them, which is somewhat curious, may be found in Reeve's *History of the English Law*.

Under the provisions of the 3rd and 4th William IV.,

c. 27, all writs of entry as well as writs of right were abolished, from the 31st December, 1834.

ENVOY, a diplomatic minister or agent, inferior in dignity to an ambassador, but generally invested with equal powers. [AMBASSADOR. DIPLOMACY.]

ENYED, NAGY-ENYED, ENIED, or STRASZBURG, a town in the county of Carlsburg or Unteralben, in Transylvania. It is situated in 46° 18′ N. lat., and 23° 42′ E. long., in a valley on the right bank of the Marosh: it is built in the old-fashioned style, is the seat of the district government, and is governed by its own magistracy, the head of whom is styled 'Doctor Nobilium.' Enyed contains a Roman Catholic, a Lutheran, and a Reformed Lutheran church; but is most celebrated for its richly endowed college (founded in 1629) for Protestant students, the number of whom is above 1900, and they are accommodated in 84 halls and chambers. The college has a library, and collections of coins and in natural history and experimental philosophy. On the market-place are the remains of the ancient burg or castle, with its towers and loopholes, in which the Saxons, who built the town, were accustomed to defend themselves against their Transylvanian assailants in former days. It now contains the parish minister's residence and two places of worship. The streets still retain their Saxon names, although the town is now inhabited principally by Magyars or Hungarians. The population is about 5100, among whom are some Saxons, Armenians, Greeks, and Walachians. There are a paper-mill and some manufactories in the town, and extensive vineyards in the neighbourhood. The Magyár language is said to be spoken here with remarkable purity.

EOLI'DIA, Cuvier's name for a genus of *Nudibranchiata* (the second order of his Gastropods) [NUDIBRANCHIATA]. In De Blainville's arrangement *Eolidia* is placed next to *Cavolina*, under his family *Polybranchiata*, with the name of *Eolidea*, and it forms, under the appellation of *Eolis*, the second genus of Lamarck's *Tritoniens*, the first section of his Gastropods, with external branchiæ placed above the mantle, either on the back or on the sides, and not being in a particular cavity. Cuvier describes his *Eolidiæ* as having the form of small snails or slugs (Limaces) with four tentacula above, and two at the sides of the mouth. Their branchiæ, he observes, are laminæ, or foliations disposed like scales, more or less close set on each side of the back. Rang, who includes under *Eolidia* two subgenera, viz. the *Eolidiæ*, properly so called, and Bruguière's *Cavolinæ*, gives the following generic character.

Animal pelagian, limaciform, gelatinous; head distinct, furnished with two or three pairs of tentacula; foot entire, and occupying nearly the whole length of the animal; branchiæ formed of flattened or conical cirrhi, disposed in rows on the superior part of the body; organs of generation united in the same tubercle on the right side anteriorly; vent a little more backwards.

Geographical Distribution.—Cuvier, speaking of his *Eolidiæ*, says, that there are some of them in all seas. Rang observes, that the genus is composed of a great quantity of small pelagic and littoral animals. The masses of *fucus natans*, which are so often met with between the tropics, always present, he states, a great number of them, and it is easy to recognize them from their elongated and creeping form, as well as from the tentaculiform branchiæ with which they are beset. They do not swim, according to the last-named author, but they suspend themselves at the surface of the water with the foot uppermost, and move well by means of sudden undulations.

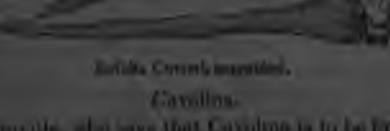
*

Eolidiæ properly so called.

Branchiæ disposed in transverse rugæ distant from each other.

Eolidia.

Example.—*Eolidia Cuvieri.*
Locality.—European seas.

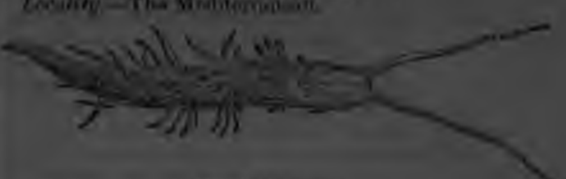


Eolidia Cuvieri, magnified.

Cavolina.

De Blainville, who says that Cavolina is to be found in all seas, remarks, that this closely approaches the preceding, and might without inconvenience be united with it, thus confirming the arrangement of M. Rang.

Example.—*Cavolina peregrina.* (*Doris peregrina*, Gmel. Cavolin. polyp. mar. 3, p. 180, t. vii., f. 3.)
Locality.—The Mediterranean.



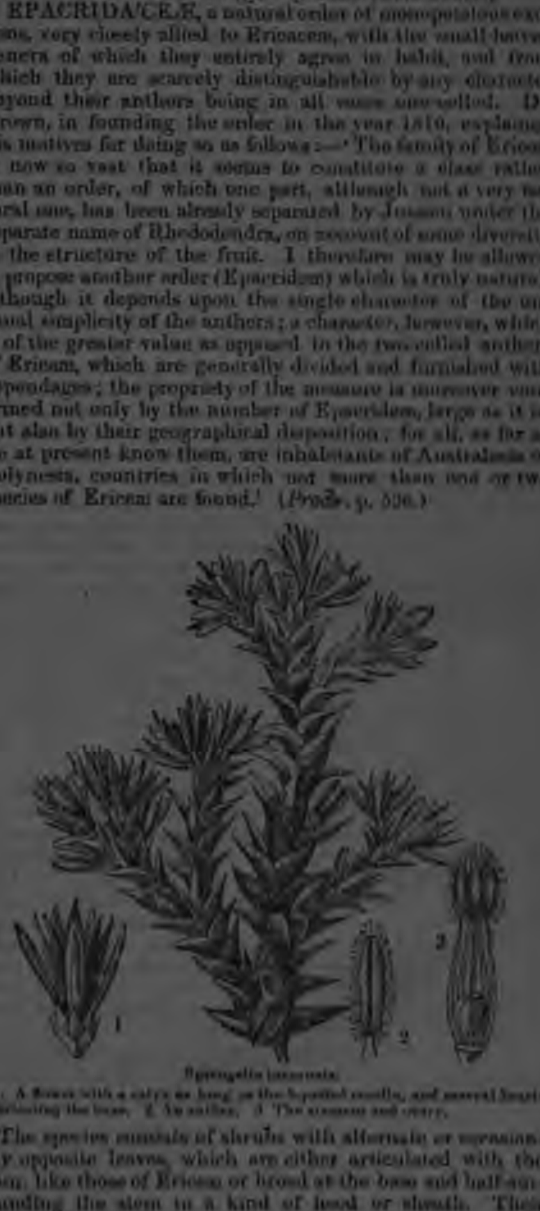
Cavolina peregrina.

De Blainville states that he has examined a very small species brought home by MM. Quoy and Gaimard (Voyage of the Uranie).

EOLIPILE. [ÆOLIPILE.]

EOPSA'LTRIA (Zoology). [PACHYCEPHALINÆ.]

EPACRIDA'CEÆ, a natural order of monopetalous exogens, very closely allied to Ericaceæ, with the small-leaved genera of which they entirely agree in habit, and from which they are scarcely distinguishable by any character beyond their anthers being in all cases one-celled. Dr. Brown, in founding the order in the year 1810, explained his motives for doing so as follows:—'The family of Ericeæ is now so vast that it seems to constitute a class rather than an order, of which one part, although not a very natural one, has been already separated by Jussieu under the separate name of Rhododendra, on account of some diversity in the structure of the fruit. I therefore may be allowed to propose another order (Epacrideæ) which is truly natural, although it depends upon the single character of the unusual simplicity of the anthers; a character, however, which is of the greater value as opposed to the two-celled anthers of Ericeæ, which are generally divided and furnished with appendages; the propriety of the measure is moreover confirmed not only by the number of Epacrideæ, large as it is, but also by their geographical disposition; for all, as far as we at present know them, are inhabitants of Australasia or Polynesia, countries in which not more than one or two species of Ericeæ are found.' (*Prodr.* p. 536.)



Sprengelia incarnata.

1. A flower with a calyx as long as the bipartite corolla, and several bracts imbricating the base. 2. An anther. 3. The stamens and ovary.

The species consist of shrubs with alternate or occasionally opposite leaves, which are either articulated with the stem, like those of Ericeæ or broad at the base and half-surrounding the stem in a kind of hood or sheath. Their flowers are usually monopetalous, but as in the order Ericaceæ, it is not unfrequent to find them with their corolla divided or divisible into several pieces, and therefore truly polypetalous. The size and colour of the corolla are often striking, and the species then become exceedingly showy, and are favourites with gardeners. None of them are of any particular use, unless those are considered an exception whose succulent fruit is eatable, like Lissanthe sapida and others, which constitute the Australian cranberries.

Dr. Brown mentions 24 genera and 144 species of this order in his work upon the New Holland Flora, but a considerable number has to be added.

EPACT, the number of days in the moon's age at the beginning of the year.

EPAMINONDAS, a Theban statesman and soldier, in whose praise, both for talents and virtue, there is a remarkable concurrence of antient writers. Nepos observes that, before Epaminondas was born, and after his death, Thebes was always in subjection to some other power: on the contrary, while he directed her councils, she was the head of Greece. His public life extends from the restoration of democracy, by Pelopidas and the other exiles, B.C. 379, to the battle of Mantineia, B.C. 362. In the conspiracy by which that revolution was effected he took no part, refusing to stain his hands with the blood of his countrymen; but thenceforward he became the prime mover of the Theban state. His policy was first directed to assert the right and to secure the power to Thebes of controlling the other cities of Bœotia, several of which claimed to be independent. In this cause he ventured to engage his country, single-handed, in war with the Spartans, who marched into Bœotia, B.C. 371, with a force superior to any which could be brought against them. The Theban generals were divided in opinion whether a battle should be risked: for to encounter the Lacedæmonians with inferior numbers was universally esteemed hopeless. Epaminondas prevailed with his colleagues to venture it; and devised on this occasion a new method of attack. Instead of joining battle along the whole line, he concentrated an overwhelming force on one point, directing the weaker part of his line to keep back. The Spartan right wing being broken, and the king slain, the rest of the army found it necessary to abandon the field. This memorable battle was fought at Leuctra. The moral effect of it was much more important than the mere loss inflicted on Sparta, for it overthrew the prescriptive superiority in arms claimed by that state ever since its reformation by Lycurgus.

This brilliant success led Epaminondas to the second object of his policy—the overthrow of the supremacy of Sparta, and the substitution of Thebes as the leader of Greece in the democratical interest. In this hope a Theban army, under his command, marched into Peloponnesus early in the winter, B.C. 369, and, in conjunction with the Eleians, Arcadians, and Argians, invaded and laid waste a large part of Laconia. Numbers of the Helots took that opportunity to shake off a most oppressive slavery; and Epaminondas struck a deadly blow at the power of Sparta, by establishing these descendants of the old Messenians [Aristomenes] on Mount Ithome, in Messenia, as an independent state, and inviting their countrymen, scattered through Sicily and Italy, to return to their antient patrimony. Numbers, after the lapse of 200 years, obeyed the call. This memorable event is known in history as the return of the Messenians.

In 368 B.C. Epaminondas again led an army into Peloponnesus; but not fulfilling the expectations of the people, he was disgraced, and, according to Diodorus (xv. 71), was ordered to serve in the ranks. In that capacity he is said to have saved the army in Thessaly, when entangled in dangers which threatened it with destruction; being required by the general voice to assume the command. He is not again heard of in a public capacity till B.C. 366, when he was sent to support the democratic interest in Achaia, and by his moderation and judgment brought that whole confederation over to the Theban alliance without bloodshed or banishment.

As the narrowness of our limits forbids us to trace the motives which led to the formation of so powerful a Theban party in Peloponnesus, so we cannot enter into the causes of its decline, except by saying, that it soon became plain that a mere change of masters, Thebes instead of Sparta, would be of no service to the other states. Achaia first, then Elis, then Mantineia and great part of Arcadia, returned to the Lacedæmonian alliance. To check this defection Epaminondas led an army into Peloponnesus for the fourth time, B.C. 362. Joined by the Argians, Messenians, and part of the Arcadians, he entered Laconia, and endeavoured to take Sparta by surprise; but the vigilance of Agesilaus just frustrated this scheme. Epaminondas then marched against Mantineia, near which was fought the celebrated battle in which he fell. The disposition of his troops on this occasion was an improvement on that by which he had gained the battle of Leuctra, and would have had the same decisive success, but that in the critical moment, when the Lacedæmonian line was just broken, he received a mortal wound. The Theban army was paralyzed by this misfortune; nothing was done to improve a victory which might have been made certain, and this battle, on which the expectation of all Greece waited, led to no important result. 'Each party,' says Xenophon, 'claimed the victory and neither gained any advantage: indecision, trouble, and confusion, more than ever before that battle pervaded Greece.'

Whether Epaminondas could much longer have upheld Thebes in the rank to which he had raised her, is very doubtful: without him she fell at once to her former obscurity. His character is certainly one of the fairest recorded in Grecian history. His private life was moral and refined; his public conduct uninfluenced by personal ambition, or by personal hatred. He was a sincere lover of his country, and if, in his schemes for her advancement, he was indifferent to the injury done to other members of the Grecian family, this is a fault from which, perhaps, no Greek statesman, except Aristides, was free. (Xenophon, *Hellen.*; Plutarch, *Pelopidas*, *Agis*, &c.)

EPAULEMENT originally signified a mass of earth, about 7 feet 6 inches high and 18 or 20 feet thick, which was raised for the purpose either of protecting a body of troops at one extremity of their line, or of forming a wing or shoulder of a battery to prevent the guns from being dismounted by an enfilading fire. The term is now, improperly however, used to designate the whole mass of earth or other material which protects the guns in a battery both in front and on either flank; and it can only be distinguished from a parapet by being without a banquette, or step, at the foot of the interior side, on which the men stand to fire over a parapet. That part of the epaulement which is between every two embrasures is called a merlon, and the part under the embrasure is called the genouillère.

EPE'E, CHARLES MICHEL DE L'. A comparative estimate of L'Épée's character and labours has been given under Deaf and Dumb: the following are a few biographical particulars respecting him.

He was born at Versailles, in November, 1712. His father was the king's architect, a man of talent and probity. Young L'Epée was educated for the church, a profession to which his mild, cheerful, and pious disposition peculiarly fitted him. There were difficulties at first in the way of his admission to the priesthood. He was required, according to the established practice of the diocese of Paris, to sign a formulary of faith; and this being opposed to his own opinions (which were Jansenist), he could not do so conscientiously. He was however admitted to the rank of deacon, but was told never to pretend to holy orders. This obstruction led him to the study of the law, but this profession did not suit the bias of his mind. At last he succeeded in obtaining holy orders, being ordained by the bishop of Troyes, a nephew of Bossuet. From him M. de l'Epée received a canonry in the cathedral of Troyes.

An accidental circumstance led him to devote himself to the instruction of the deaf and dumb. Business took him one day to a house where he found only two young women, who were busily engaged in needlework, but paid no attention to his questions. The mother of the young women arriving shortly afterwards, explained to him with tears that they were deaf and dumb. An ecclesiastic named Vanin had commenced the education of these young persons by means of pictures; but death had removed him, and no other person had offered to instruct the mutes. 'Believing,' says M. de l'Epée, 'that these two children would live and die in ignorance of their religion, if I did not attempt some means of instructing them, I was touched with compassion, and told the mother that she might send them daily to my house, and that I would do whatever I might find possible for them.'

John Paul Bonet's book came in the way of M. de l'Epée; a person offered a copy of it to him, urging him to buy it, which he at first refused, not knowing the nature of the work, and alleging that he did not understand Spanish, and that the book was therefore of no use to him. Opening it casually, he found the copper-plate engraving of Bonet's one-handed alphabet. The book was immediately bought, and De l'Epée learned Spanish to enable him to read it.

M. de l'Epée was persevering and disinterested in his instruction of the deaf and dumb. He persevered until he converted opposition and contempt into approbation. His income was about 400*l.*, of which he allowed about 100*l.* for his own expenses, and appropriated the remainder to the support and instruction of indigent mutes. 'The rich,' he said, 'only come to my house by tolerance; it is not to them that I devote myself—it is to the poor; but for them, I should never have undertaken the education of the deaf and dumb.'

M. de l'Epée died December 23, 1789, aged 77. His memory received various honours; his funeral oration was pronounced by the Abbé Fauchet, the king's preacher. He ranks deservedly among those whose lives have been devoted to the amelioration of the condition of their fellow men, and the fruit of whose labours do not die with them. (*Gallery of Portraits.*)

EPE'RIES, or Presow, a royal free town, and the capital of the county of Sáros, in Upper Hungary, in 48° 59′ N. lat., and 21° 15′ E. long. It is situated in an agreeable country on the banks of the Tartza, is surrounded with walls defended by bastions, which are encircled by extensive gardens and inclosures, among which are the suburbs. It contains about 900 houses and 7500 inhabitants. The streets are broad, and embellished with several handsome buildings, among which are the county hall, four Roman Catholic churches, a Lutheran church, a synagogue, the quadrangular buildings of the Protestant college, a Roman Catholic high-school, attached to the monastery of Franciscans, who conduct it, a head Normal school, a chapter-house, town-hall, orphan asylum, and refuge for the indigent. It is the seat of a Greek Catholic bishopric erected in 1807, has a good episcopal library, and is frequented by the pious for the sake of an imitation of Mount Calvary, on which several chapels are built. Eperies manufactures woollens and linens, and possesses a large earthenware manufactory and breweries, as well as a considerable trade in cattle, wine, and grain, to which the annual fairs greatly contribute. About four miles from the town, the environs of which are agreeably diversified, there is an esteemed chalybeate, called Czemete or Kreyzna-voda, with baths.

EPERNAY, a town in France, in the department of Marne, on the south bank of the river Marne, 72 miles in a straight line east by north of Paris.

The antient name of the town is said to have been Aquæ Perniciæ, from which came first Aixperne and afterwards Epernay. At an early period Epernay belonged to the archbishops of Reims, by whom a fortress was built here. In the wars of the English in France Epernay was twice besieged. In the earlier part of the sixteenth century it was burnt by François I. in order to destroy the stores which the Emperor Charles V. had established here. In the religious contests of the same century it was also an object of contest: it was besieged and taken by the Spaniards and Leaguers; and retaken in 1592 by Henri IV. In 1657 Epernay was ceded to the duke of Bouillon in exchange for the sovereignty of Sedan; but the duke never exercised all his rights.

Epernay is in a small valley in the midst of a romantic country, well wooded, and producing the finest Champagne wines. It is a handsome town. It has a church of modern construction, built in the place of one of greater antiquity, of which only the gate remains. There are some remains of the antient fortifications of the town, consisting of a gate and two towers. The population in 1832 was 5318. The inhabitants carry on a considerable trade in wine, which is deposited in deep and extensive cellars hollowed out in the chalk on which the town is built. They manufacture a great quantity of earthenware. Of the utensils manufactured half are sent to Paris in boats which descend the Marne, and a quarter into Lorraine; the rest is sent into Picardie or is retained for home use. The clay of which it is made is dug about fifteen miles from Epernay: large quantities of it are sent in an unwrought state to Paris and into the departments of Meurthe and Aisne. Millstones are quarried in the neighbourhood of the town; and sand is dug, which is much sought after for making glass, and is sent by land-carriage into Lorraine and even into Alsace. Many women are employed in making hats, purses, bags, &c., of silk twist. Hosiery and woollen yarn are manufactured.

There are at Epernay a theatre, a high-school, and a library of 12,000 volumes. It is the capital of an arrondissement, which contained in 1832 a population of 93,278.

EPHE'MERIS (ἐφημερίς, from ἐπί, and ἡμέρα), a name given to almanacs, from their containing matter for each day. In astronomy it is usual to call any table which assigns the place of a planet for a number of successive days an ephemeris of the planet. [Almanac.]

EPHESIANS, ST. PAUL'S EPISTLE TO THE, is the fifth, in numerical order, of the fourteen apostolical letters of St. Paul, contained in the canon of the New Testament. Throughout the primitive ages of Christianity it was generally regarded by the principal fathers as being of genuine and sacred authority. According to Dr. Lardner (*Credibility of Gosp. Hist.*, vol. ii.) the writings of Ignatius, who was St. Paul's contemporary, contain several citations from this epistle. It is also cited by Irenæus, Clemens Alexandrinus, Tertullian, Origen, and many subsequent Christian writers. There were, however, several important and numerous sects, as the Nazarenes or Ebionites (paupers) and the Severians, Encratites and other followers of Tatian, who, in the first and second centuries, denied both the genuineness and the authenticity of this and the other writings of St. Paul; rejecting them as a tissue of errors, and denouncing St. Paul himself as an apostate, and a perverter of the original system of Jesus of Nazareth. (Origen *contra Celsum*, l. v.; Euseb. *Eccles. Hist.*, l. iii., c. 21 and 27; Epiphanius, *Hæres.* 30; Hieron. *in Matth.*, c. 12; Nicephorus, *Hist. Eccles.*, l. iv., c. 4, l. v., c. 12; Toland's *Nazarenus*, p. 25—29.) A second epistle of St. Paul to the Ephesians is mentioned by Jerome (*De Scriptoribus Eccles.*) and by Epiphanius (*Hær.* 42). The place and date generally assigned to this epistle by biblical critics are Rome, A.D. 61, that is, in the first year of the apostle's imprisonment at Rome (ch. iii. 1, ch. iv. 1, ch. vi. 20, and the postscript), but Mr. Greswell, in his elaborate chronological disquisition on the harmony of the Gospels, says, 'St. Paul wrote no epistles in his first imprisonment.' Much has been written by commentators for and against the opinion that St. Paul addressed this letter to the Ephesians; and notwithstanding the words of the first verse, 'to the saints at Ephesus' (ἐν Ἐφέσῳ), appear in all the antient MSS., and that the postscript says, 'written from Rome unto the Ephesians,' this is doubted and denied to be the fact by Grotius, Mill, Wetstein, Vitringa, Benson, Paley, and Greswell, who adopt the statement, said by Tertullian to have been made by Marcion, that it was written to the Laodiceans. Macknight, Lardner, Hartwell Horne, and many others, see no difficulty in believing it to have been addressed to the Ephesians, though Greswell (vol. ii. p. 67) maintains that by its internal evidence it is undoubtedly shown to have been addressed, not to the Christians at Ephesus, where Paul had resided three years (*Acts* xx. 31), but to personal strangers (i. 15, iii. 2, &c.); that it has been miscalled by mistake; and that, if it be not the epistle which Paul wrote to the Laodiceans (*Coloss.* iv. 16), that apostolical epistle must have been lost, for the one with this title inserted in the 'Codex Fabricii' and in Jones's work on the Canon, though of a very early date, is regarded as a forgery. Usher, Bengel, Michaelis, and Hug suppose it to be *encyclical*, that is, intended for circulation. The style is exceedingly animated and fluent, and has less of the metaphorical obscurity which generally characterises the compositions of St. Paul. The object appears to be to establish an earnest faith in the doctrines of Christianity, by giving exalted notions of their importance and moral excellence, and to encourage a perseverance in the Christian warfare with temporal and spiritual enemies. The three first chapters are occupied in especially setting forth the principles of predestinarianism (i. 4, 5, 11, iv. 30), and the three last are devoted chiefly to the enjoining of moral duties with respect to husbands, wives, parents, children, masters, and servants. 'No real Christian,' says Dr. Macknight, 'can read the doctrinal part of this epistle without being impressed and roused by it, as by the sound of a trumpet.' On the undesigned coincidences with the 'Acts' see Paley's *Horæ Paulinæ*, p. 205—234. The moral and doctrinal precepts of this epistle, with respect chiefly to election, have occasioned theological writers, especially those of Germany, to write elaborately on its proper interpretation. See the comments of Borger, Roell, Rose, Schütze, Cramer, Rosenmüller, Koppe, Müller, Brinkmann, Ziegler, Krause, and Bemmelin, cited in Seiler's *Biblical Hermeneutics* by Dr. Wright; also Macknight's *Translation and Commentary on the Epistles*, 4to., vol. ii.; Michaelis's *Introduct.*, vol. iv.; Horne's *Introduct.*, vol. iv.; and the *list of Commentators and Sermons on Ephesians* in Watt's *Biblioth. Britannica*.

E'PHESUS, a city of Asia Minor, and one of the twelve that belonged to the Ionian confederation. (Herod. i. 142.)

The ruins of the city are situated near the river Cayster, at a short distance from the place where it falls into the Bay of Ephesus, and near a modern village called Aiasalouk. The city, according to Pococke's plan, was irregularly enclosed with solid walls. Towards the east the external wall crosses a hill, called Lepre, which has a channel or hollow in the middle. The wall is then continued southward on the edge of a valley, which is bounded by another hill, called the Corresus. (Strab. 640.) Other internal walls extend further south across another valley, and communicate with wall-works running east and west along the side of Mount Corresus. The walls then turn northward, and extend along the side of a lake, probably Lake Selinusin, near the temple of Diana, which is about a furlong to the west of the hill Lepre. On this, the west wall, is a tower, called the Prison of St. Paul, which is a building with Gothic or pointed arches. The walls, after leaving the lake, curve on the north, and run straight toward the east on a slight eminence. Near the circus the walls are set back a short distance, and then are continued straight till they turn with a curve, and join the boundary on the Lepre hill.

The whole compass of the walls, according to Pococke, is about four miles. They are built in a rough manner, but cased with hewn stone, and defended in places with square towers. In some parts the walls remain almost entire; in others the foundations only are visible, and are ten feet thick. The site of Ephesus has been frequently changed, and Lysimachus, one of Alexander's generals, is said to have adopted the expedient of stopping the drains in the low parts of the city, in order to drive the inhabitants into the higher, or, what he conceived, the most advantageous situation for the city, which he had enclosed. (Strab. 640.) Pococke is of opinion that the ruins of the present walls are the work of Lysimachus. Part of one of the entrance-gates, adorned with some bas-reliefs remarkable for their fine taste, still remains. Within the city there were extant, at the time of Pococke's visit, ruins of theatres, a circus, and other public buildings; and without the city, on the south-east side of Lepre, are the ruins of an extensive and magnificent edifice, which Pococke supposed to be a gymnasium. The outer walls are of brick and stone, formed of four or five courses of each, laid alternately, and constructed with great solidity.

In 'The Antiquities of Ionia,' vol. ii., published by the Dilletanti Society, there is an interesting view of this gymnasium, and also a plan. (See Plate 40, and following plates.) The Cryptoporticus is full of Exedræ. There is also a Palæstra and an Ephebium, with rooms on the right and left, having a communication with the Palæstra only. A passage leads from the Ephebium to the apartments of the baths, of which there were two sets for bathing. There is however only one Laconicum. In the niche of the Calidarium, on the right hand, are painted several sorts of fish, and boys swimming on dolphins: the colours of the painting are so well preserved as to show the water to be of a light green. The Laconicum is vaulted, and is totally dark. Plate 43 gives some details of the architecture of this building.

The remains of a temple at Ephesus are given in plates 44 and 45 of the same work. This temple was 130 feet long and 80 broad. The cella is constructed of large coarse stone; the portico is of marble, and of the Corinthian order. The columns are nearly 47 feet high, and the shafts are fluted, and of one piece of stone. The style is Roman, and the temple was constructed, probably with the permission of Augustus Cæsar, to the deified Julius.

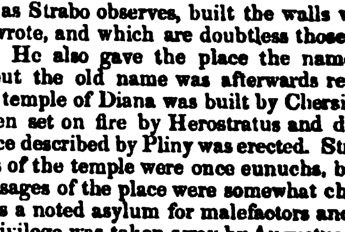
The circus is a very curious building, 780 feet long, and 290 broad: the width of the chariot-course is 135 feet. On the north side the seats are constructed on a series of arches, but on the south they are laid on Mount Lepre. The circus was entered by descending the hill side, as the boundary was surmounted with a wall, having arched openings three feet wide at about forty feet distant from each other. The masonry consists of rusticated stone-work, and the Ionic order appears to have been used in some of the decorative parts of the architecture. The great theatre, which is partly constructed, and partly hollowed out of the hill, is about 330 feet in diameter, the plan being a large segment of a circle, with thirty rows of seats.

The temple of Diana has a lake on the west side of it, which is now a morass, extending westward to the Cayster. This building and the courts about it were surrounded with a strong wall, which was a double wall to the south. Within the enclosure were four open courts, that is, one on each side of the temple; and on each side of the court to the west there was a large open portico, or colonnade, of four columns deep, extending to the lake: on these columns arches of brick were turned. The front of the temple was to the east. The temple was built on arches, and the foundation appears to have been most solidly constructed. This agrees with the statement of Pliny (xxxvi. 14), who, speaking of the great temple which existed in his time, said that it was built on marshy ground, as being thus more secure against earthquakes, and that the foundations were formed of rammed charcoal and wool. In the narrow archways of the foundation Pococke saw a great number of earthen pipes. In the front of the temple was a large portico, constructed with grey and red granite columns, some of the fragments of which are fifteen feet long and three feet six inches in diameter. Similar columns form part of the mosque of St. John at Aiasalouk, with a most beautiful composite capital. Pococke judges from the remains which he saw, that the whole building was cased with marble, and that arches were turned on the columns. The temple itself has something of the figure of a cross, and is divided into several chambers. There was probably a portico on the side opposite to the great entrance. The length of the temple, according to Pliny, was 425 feet, the breadth 220, and it contained 137 columns 60 feet high.

Ruins still remain on the lower part of the hill Lepre, and there seems to have been a suburb on the south side of Lepre, and near a mile from the south-east corner of it towards that hill, about which the present village of Aiasalouk is situated. On another hill is a Turkish castle, and round the top of the hill are extensive ruins of thick brick walls, with numerous small arches, which Pococke judges to be of the time of the Greek emperors. To the east of Mount Lepre are the burial-places. Pococke saw there a very large marble coffin (sarcophagus), with an imperfect inscription on it, and he says he has reason to think that they cut holes in the rock in order to deposit their dead there. There are several arches all round the hill, and on some of them are ruins of an aqueduct. On the low ground between the hill Lepre and the village of Aiasalouk there are remains of many square piers, made of single stones laid one on another. Not only on the sides of Mount Lepre, but on Mount Corresus, as well as in the valley between them, there are still great ruins of the antient city.

Mounts Lepre and Corresus being of marble, probably supplied abundant materials for building. (Pococke's *Travels;* and *The Antiquities of Ionia, by the Dilletanti Society.*)

According to Strabo, the oldest inhabitants of the site of Ephesus were Carians and Leleges, most of whom were ejected by the settlers from Greece under Androclus. Lysimachus, as Strabo observes, built the walls which existed when he wrote, and which are doubtless those described by Pococke. He also gave the place the name of his wife Arsinoë, but the old name was afterwards restored. The first great temple of Diana was built by Chersiphron, which having been set on fire by Herostratus and destroyed, the great edifice described by Pliny was erected. Strabo says that the priests of the temple were once eunuchs, but that in his time the usages of the place were somewhat changed. This temple was a noted asylum for malefactors and for debtors, till this privilege was taken away by Augustus. In Strabo's time Ephesus was a place of great trade, and the chief commercial city of the western part of Asia Minor; and it would appear from the Acts of the Apostles (xix.) that it was a place of some note for workers in silver.



Coin of Ephesus.

British Museum. Actual Size. Silver. Weight, 176½ grains.

E'PHORI (ἔφοροι), a body of magistrates at Sparta, who were possessed of great privileges. The institution of this office is usually ascribed to Theopompus, the grandson of

Charilaus the Proclid, but it has been inferred from the existence of an ephoralty in other Dorian states before the time of Theopompus, and from its being apparently placed among the institutions of Lycurgus by Herodotus (i. 65) and Xenophon (*de Rep. Lac.* viii. 3), that it was an antient Dorian magistracy. Dr. Arnold supposes (*Thucyd.*, vol. i., p. 646) that the ephori, who were five in number, were coeval with the first settlement of the Dorians in Sparta, and were merely the municipal magistrates of the five hamlets which composed the city (see Müller, *Dorians*, ii. p. 130, Engl. transl.); but that afterwards, when the Heraclidæ began to encroach upon the privileges of the other Dorians, and, it would seem, in the reign of Theopompus, who endeavoured to diminish the powers of the general assembly of the Spartan aristocracy, the Dorians, in the struggle which ensued, gained for the ephori an extension of authority which placed them virtually at the head of the state, although the nominal sovereignty was still left in the hands of the Heraclidæ. Thus the ephori were popular magistrates, as far as the Dorians themselves were concerned, and were in fact the guardians of their rights from the encroachments of the kings, though they were in relation to the Perioeci (*περίοικοι*) the oppressive instruments of an overbearing aristocracy. (Plato, *Legg.*, iv., p. 712 D.) The ephori were chosen in the autumn of every year; the first gave his name to the year: every Spartan was eligible to the office without any regard to age or wealth. They were empowered to fine whom they pleased, and exact immediate payment of the fine; they could suspend the functions of any other magistrate, and arrest and bring to trial even the kings. (Xenophon *de Rep. Laced.*, viii. 4.) They presided and put the vote in the public assemblies (Thucyd., i., 87), and performed all the functions of sovereignty in receiving and dismissing embassies (Xen. *Hell.*, ii., 13, 19), treating with foreign states (Herod., ix., 8), and sending out military expeditions. (Xen., *Hellen.*, ii. 4, 29.) The king, when he commanded, was always attended by two of the ephori, who exercised a controlling power over his movements. (Herod., ix., 76.) The ephori were murdered on their seats of justice by Cleomenes III., and their office overthrown (Plutarch, *Vit. Cleomen.*, c. viii.); but they were restored by Antigonus Doson and the Achæans in 222 B.C. (Polyb., ii., 70; Pausan., ii., 9, 2); and the office subsisted under the Roman dominion. (See Böckh, *Corpus Inscriptionum*, i., p. 604-612.) On the ephoralty, the reader may consult Müller's *Dorians*, book iii., c. 6; Plass's *Geschichte des alten Griechenlands*, vol. ii., p. 113; and Tittmann's *Darstellung der Griech. Staatsverfassungen*, p. 104-117.

EPHORUS, a Greek historian, born at Cyme in Æolis, in the year 405 B.C. (*Suidas.*) He survived the passage of Alexander into Asia (333 B.C.), which he mentioned in his history. (Clem. Al., *Strom.*, i., p. 337 A.) He studied rhetoric under Isocrates, but with so little success that after he had returned from Athens his father Demophilus sent him back to the rhetorician for fresh instructions. (Plutarch, *Vit. Isocratis*, p. 466 Wyttenb.) Isocrates perceiving his unfitness for public speaking, recommended him to turn his attention to historical composition (Seneca *de Tranquillit. Animi*, c. vi.); but his style was low and slovenly even in his histories (Dio., i., p. 479); and Plutarch remarks upon the silliness of the set speeches which he introduced. (*Polit. Præcep.*, p. 803 B.) Polybius observes that, though in his account of naval matters he is sometimes happy, he always fails in describing battles by land, and was entirely ignorant of tactics. (*Excerpt. Vatican.*, p. 391.) Ephorus wrote—1. A History of Greece, in 30 books, beginning with the siege of Troy, and terminating with the siege of Perinthus (340 B.C.). Part of the thirtieth book was written by his son Demophilus. (Diod., xvi., 14.) 2. On Inventions, in 2 books. 3. On Goods and Ills, in 24 books. 4. On remarkable Objects in various Countries, 15 books. 5. The Topography of Cyme. 6. On Diction. The fragments of these works have been collected by Meier Marx. Carlsruhe, 1815.

EPHYRA. [Medusa.]

EPIALTUS. [Maiidæ.]

EPIC POETRY is that form of art which produces an imaginative description of external facts and occurrences, as distinguished from lyric poetry, which employs itself in representing, in an imaginative manner, all those internal facts and occurrences which go by the name of feelings and emotions.

Those who find this definition insufficient must remember that it does not and is not intended to apply to any single epic or lyric poem. With the exception perhaps of some of our old national romances, there does not exist an epic poem of any length which is perfectly free from lyrical passages; but this is no reason why we should confound the two forms of art, and not assign to poetry the one name or the other according to the proportion which it contains of either element.

From what we know of the operations of our own minds, and of the analogy which subsists between the growth of individual and national intellect, it appears most natural that epic should be the earliest species of poetry. A child, borne into a crowd of circumstances all claiming his attention and exciting his interest, busies himself with the external world long before it ever occurs to him to examine what is going on within himself. Nay, more than this, his imagination, the idealizing faculty, takes the models of its exertions entirely from the external world. His dreams, his reveries, his waking fancies are active and epical, as any one who has watched the movements of children must acknowledge; but the time when he begins to notice his own thoughts and feelings—the lyrical age—does not come till later.*

The progress of literature bears a close analogy to that growth of an individual mind which we have just described. Men look round them before looking within, and thus it is that natural philosophy has always preceded metaphysics, and epic poetry, as far as we know, been prior to lyrical. Again, the imagination gets the start of the logical faculty. Men can invent before they can argue, and thus it appears that facts, real or supposed, are usually put in the imaginative form of epic poetry before they are recorded and examined with regard to the conclusions which they suggest, as in political history. (Schelling, *Vorlesungen über die Methode des Academischen Studium*, p. 226.) It may be objected to this theory, that if we assert every individual to have gone through both epical and lyrical periods, there is no reason why the two forms of art which we suppose to have arisen from the prevalence of either set of feelings should not have been contemporaneously produced; but it will be seen that a sufficient reason is supplied for the priority of that form which addresses itself to the spirit of action, in the fact that this spirit predominates in the earliest ages of society, to the complete repression—we might almost say destruction—of those contemplative feelings which in after ages are allowed full and unrestrained exercise. The heroic age of Greece, for instance, as far as we know anything about it, was very little likely to encourage reflection, much less reflective poetry, and accordingly we hear nothing of such poetry for centuries after it had ceased.

The earliest specimens of this form of art, which probably consisted of tales rhythmically arranged and recited to a very simple musical accompaniment, no doubt belonged to the unconscious æra, during which the poet, setting before him no aim, or seeing it at best but very imperfectly, acts purely from the stirring impulse of his own imagination. Into this class we may perhaps admit some of our oldest and simplest romances, but the poetry of Homer and Hesiod, the twofold epic of the Greeks, cannot be denied to be, in great measure at least, the work of conscious artists. We shall notice the writings of the early Greeks first in order; and as it would swell this article to an unnecessary length were we to examine in detail the principal epic poems which we possess, we shall confine ourselves, in a great measure, to those which were composed during the periods both of antient and modern history, when epic poetry could be said to be the poetry of the age, and leave those detached productions which owe their existence to the imagination of isolated men, in times long after the disappearance of the living epos, for a separate examination.

There are two divisions into which the epic poetry of the Greeks naturally falls; the heroic or romantic epos of Homer and of the Cyclic poets, and the hieratic epos of Hesiod. The attention of that age was centered, as ours is at present, on two grand ideas, the state and religion; whence we find a political and a hieratic epos. The Iliad and Odyssey are the two poems which remain as specimens of the former kind, and they are particularly worth the attention of all who are interested in the history of epic poetry, as they afford by far the most perfect instance of poems of that kind composed in an age differing but little in its characteristics from that to which they refer, and stand consequently in strong contrast to the Æneid, a poem with which they are most frequently compared. The Æneid, in common with most Latin poetry, depends more on beauty of language and arrangement than on anything in the story, exquisitely managed as it is, to excite the interest of its readers. As it traces the life of an individual, it stands in closer juxta-position with the Odyssey than with the Iliad; but how superior is Ulysses to Æneas, and how much more romantic are the adventures of the Greek than those of the Trojan hero!

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* We are aware that this is opposed to the assertion of a late German writer (Wilhelm Müller, *Homerische Vorschule*, p. 5); but he has not advanced any arguments which lead us to change our opinion on the point.

Perhaps there is not in the whole compass of literature a more perfectly drawn character than Ulysses, certainly none proceeding from so early a source. His touching exhibitions of feeling, the inimitable circumstantiality of the fictions which he spins in such profusion, apparently for no purpose except to confound his auditors; the manner in which all the interest of the story winds around him, the comic nature of the interludes, and the peculiarities attaching to the supernatural parts of his adventures, all unite to render the Odyssey a poem more fitted perhaps than the Iliad itself to interest an age like ours, when everything which gives a lyrical character to poetry is so much although so unconsciously sought for.

It usually happens that sacred poetry partakes strongly of a lyrical character, and Hesiod has perhaps struck out the only path which an epic writer in a simple age could follow without lapsing into the lyrical spirit as he approached theological subjects. The only poet of antiquity with whom he can be compared is Lucretius, but the 'De Rerum Naturâ' approaches so much more nearly to the character of a treatise on philosophy, that it is hard to give it the name of an epic poem, although it, as well as all didactic works like Virgil's Georgics, come under the definition. The reason why we are slow to recognize them as epics arises from the habit of taking the heroic epos, one species, although the primary one, for the whole class, which really includes other species, as a reference to our definition cannot fail to show.

It has been observed by a German writer (Schelling, *Vorlesungen*, &c., p. 224) that, properly speaking, an epic poem has no regular beginning or end; it is a metrical and imaginative production, which, if it consist of narrative, may take it up and lay it down at any period. This is the case with the Iliad, as well as with the Odyssey and Æneid, although the two last are considerably more complex in the arrangement of the narrative, and evidently draw to a more decided close than the Iliad. There appears however to be a greater unity in the plot of the Odyssey than in that of Virgil's poem, in this respect, that the events never get the upper hand of the hero. We are interested in his adventures because they are his; while in the Æneid they strike us rather as embellishments intended to possess independent merit.

The early romantic epos deserves notice as the first distinct form of modern art. Much discussion has been expended in order to ascertain whence arose those cycles of metrical romances which have for their subjects the exploits of Alexander the Great, King Arthur, and other heroes; but it rather concerns us here to notice that the second birth of civilization which ensued on the breaking up of the Roman empire was productive of a series of events in literary history, parallel, as far as we can judge, to those which occurred in the times of Homer.

The traces of heroic poetry which remain in Livy's History are plain enough to enable us to infer with considerable probability that a series of epic poets appeared in Rome about the time of the Tarquins onwards; but as no fragments remain, we are too much in the dark as to the nature of their writings to enable us to refer to them as we do to Homer.

We find that the northern nations possessed numerous poems of an epical kind, some of which remain, and are or might be read with considerable interest. The cycles of romances on Troy and Alexander the Great compose a form of art which could only exist in a revival of imaginative spirit, as they derive their subjects from an older date and a different country, although, as regards every thing but the name of Greek or Trojan, the hero is usually the countryman of the bard; but the numerous poems on Arthur, with 'Havelok the Dane,' and 'Horn Child,' in our own language, 'Beowulf,' in Anglo-Saxon, 'The Poem of the Cid,' in Spanish, and the 'Nibelungen Lied,' in old German, are quite sufficient proofs of the coincidence of epic spirit with an early stage of society.

The Italian epic arose somewhat later than that of any of the northern nations, which may be attributed to the fact that it was only to a strong admixture of barbarian blood that the Italians owed their restoration to political existence. The dregs of a nation never possess a national literature.

Coleridge has observed that 'Gothic art depends on a symbolical expression of the infinite,' or what cannot be circumscribed within the limits of actual sensuous being; while in antient art everything was finite and material. (*Lit. Remains*, vol. i. p. 68.) This applies more directly to architecture, but in a measure also to literature, although we think that the introduction of Christianity had more to do with it than the cause which Coleridge assigns, namely, the wild liberty of the Northman's habits and manners and the imagery of nature which surrounded him. Perhaps the greatest difference which is traceable between the antient and the modern epic has been produced by that spirit of devotion to the female sex which characterizes all the Gothic nations; and arising as it does, partly from the refinement of an instinct and partly from religious impressions,* is very superior, as a motive of action, to the mere unmitigated instinct for war which constitutes the prevailing feature of the antient epic, or at least of the heroic poems.

We have been at no pains to notice those detached epic poems which have appeared at different times since the revival of learning, although some of the most noble specimens of this style of poetry are to be numbered among them; still less have we intended to give anything like sketches of any which we have mentioned, as this is properly done under the heads of the several authors.

(Thirlwall's *History of Greece*, vol. i.; Ulrici, *Geschichte der Hellenischen Dichtkunst;* Dunlop, *History of Roman Literature;* Baehr, *Abriss der Römischen Literatur-Geschichte; History of Spain* in the *Cabinet Cyclopædia*, vol. ii., Appendix H.)

EPICHARMUS, the son of Helothales, was born in the island of Cos, and accompanied Cadmus, the son of Scythes, to Sicily about the year 485 B.C. He must have arrived at maturity by this time; for he was a pupil of Pythagoras (who died in 497 B.C), and according to Aristotle (*Poet.* 5), lived long before Chionides and Magnes (who, if we may believe Suidas, began to exhibit in 487 B.C.); so that there can be no truth in the statement of Diogenes, that Epicharmus was brought from Cos to Sicily when a child of three months old (viii. 78). He and his brother were physicians, and therefore, perhaps, belonged to the Coan house of the Asclepiads. It appears that he resided a short time at Megara, and possibly removed to Syracuse when Gelo transported the inhabitants of Megara thither (484 B.C.). It was at Megara that Epicharmus probably got the idea of writing comedies; for the Megareans, as well in Greece as in Sicily, are always spoken of as the originators of that branch of the drama. Epicharmus is called by Theocritus (*Epigram.* xvii.) the inventor of comedy, and Plato says that he was the chief comedian, just as Homer was the chief tragedian. (*Theætet.*, p. 1[illegible] E.) The latter remarks refer, we believe, to his having first furnished the *comus*, or band of revellers, who were the original chorus in comedy, with a systematic dialogue and a plot of an epic character. That the comedies of Epicharmus had a chorus, and that this chorus was the representative of the comus, as in the old Athenian comedy, appears probable from the fact that one of his dramas was called 'Vulcan,' or the '*Comastæ*.' 'The subjects of the plays of Epicharmus,' says Müller (*Dorians*, iv. 7, § [illegible]), 'were mostly mythological, *i. e.*, parodies or travesties of mythology, nearly in the style of the satirical drama of Athens. Thus, in the comedy of "Busiris," Hercules was represented in the most ludicrous light, as a voracious glutton; and he was again exhibited in the same character (with a mixture, perhaps, of satirical remarks on the luxury of the times) in "The Marriage of Hebe," in which an astonishing number of dishes was mentioned. He also, like Aristophanes, handled political subjects and invented comic characters like the later Athenian poets; and indeed the extent of his subjects was very wide. The piece called

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* The worship of the virgin in particular. (Coleridge, ubi supra.)

"The Plunderings," which described the devastation of Sicily in his time, had a political meaning; and this was perhaps also the case with "The Islands," at least it was mentioned in this play that Hieron had prevented Anaxilas from destroying Locri. In his "Persians" also there were allusions to the history of the times. Epicharmus also introduced and almost perfected characters which were very common in the drama of later times; and if the plot of "The Menaechmi" of Plautus was, as the poet seems to state in the prologue, taken from a comedy of Epicharmus, it must be granted that the ingenious construction of plots was not beyond the powers of that poet.' Epicharmus lived to the age of ninety (Diog. *Laert.* viii. 78) or ninety-seven (Lucian, *Macrob.* xxv.). The titles of thirty-five of his comedies are given in Fabricius (ii. p. 300).

EPICTETUS was born at Hierapolis, a city of Phrygia. The year of his birth is not known, nor are we able to make any very close approximation to it. He must have been born however before the end of the reign of the emperor Nero, 68 A.D.; else he could not have been more than twenty-one when Domitian published that edict against philosophers, in the year 89 A.D., in consequence of which Epictetus retired from Rome. At the age of twenty-one, he was not likely to have attained sufficient notoriety to bring him within the operation of such an edict.

Epictetus was born most probably during the last eight years of Nero's reign. The names and condition of his parents are unknown; neither do we know how he came to be brought to Rome. But at Rome he was for some time slave to Epaphroditus, who was a freedman of Nero's, and one of his body-guard. An anecdote related by Origen, which illustrates the fortitude of Epictetus, would also show, if it is true, that Epaphroditus was a most cruel master. 'Epictetus, when his master was twisting his leg one day, smiled and quietly said, "you will break it;" and when he did break it, only observed, "Did I not tell you that you would do so?"' (Origen c. *Cels.* vii. p. 368.) We are not told how or when Epictetus managed to effect his freedom; but he could not have been still a slave when he left Rome in consequence of the edict against philosophers. This, which is the only event in his life whose date we can assign, took place, as has been said, in the year 89 A.D., being the eighth year of Domitian's reign. Epictetus then retired to Nicopolis in Epirus; and it is a question whether he ever returned to Rome. The chief ground for believing that he did is a statement of Spartian (*Vit. Hadr.* 16), that Epictetus lived on terms of intimacy with the emperor Hadrian; while it is argued on the other hand, that there is no evidence of any of his discourses having been delivered at Rome, but that they contain frequent mention of Nicopolis. This argument is however hardly sufficient to overthrow the express testimony of Spartian.

We do not know when he died. Suidas says that he lived till the reign of Marcus Aurelius; and a confirmation of this statement has been thought to be furnished by Themistius, who says (*Orat. V. ad Jovian. Imp.*) that the two Antonines patronized Epictetus. But if, as there is good reason to believe, Epictetus was born before 68 A.D., the adoption of Suidas's statement would make him almost a hundred years old at his death; and what is said by Themistius might very well be true, even though Epictetus did not live under either of the Antonines. It may be added, that Suidas's account of Epictetus is in other respects inaccurate. But the strongest argument against Suidas is derived from Aulus Gellius, who, writing during the reign of the first Antonine, speaks of Epictetus in two places as being dead. (*Noct. Att.* ii. 18; xvii. 19.)

Epictetus led a life of exemplary contentment, simplicity, and virtue, practising in all particulars the morality he taught. He lived for a long while in a small hut, with no other furniture than a bed and lamp, and without an attendant; until he benevolently adopted a child whom a friend had been compelled by poverty to expose, and hired a nurse for its sake. There is a story connected with his lamp which illustrates the equanimity of Epictetus. He had bought one day an iron lamp, which was very soon after stolen from his hut, while he was himself standing in a corner wrapped in meditation; and when on looking up he came to miss it, he observed with a smile, 'I shall disappoint this thief to-morrow, for if he comes back for another lamp, he shall only find an earthen one.' (Arrian, *Epict.* i. 18.) Neither was it in trifles alone that his equanimity was manifested, as the anecdote of his patience under his master's cruelty may suffice to prove. The biographers of Epictetus have taken particular care to commemorate his love of neatness.

Epictetus was a teacher of the Stoic philosophy, and the chief of those who lived during the period of the Roman empire. An anecdote given in the 'Discourses' collected by Arrian (i. 7) seems to show that he had been a pupil of Musonius Rufus, a Stoic philosopher whom Nero banished to Gyara, and who was subsequently recalled to Rome by Vespasian. The lessons of Epictetus were principally, if not solely, directed to practical morality. His favourite maxim, and that into which he resolved all practical morality, was 'bear and forbear,' ἀνέχου καὶ ἀπέχου. He appears to have differed from the Stoics on the matter of suicide. (Arrian, *Epict.* i. 9.) We are told by Arrian in his Preface to the 'Discourses,' that he was a powerful and exciting lecturer; and, according to Origen (c. *Cels.* vi. ad init.), his style was superior to that of Plato. It is a proof of the estimation in which Epictetus was held that, on his death, his lamp was purchased by some more eager than wise aspirant after philosophy for three thousand drachmae. (Lucian, *adv. Indoct. lib. emont.*, tom. ii., p. 100.)

Though it is said by Suidas that Epictetus wrote much, there is good reason to believe that he himself wrote nothing. His Discourses were taken down by his pupil Arrian, and published after his death in six books, of which four remain. The same Arrian compiled the Enchiridion, and wrote a life of Epictetus, which has been lost. [ARRIAN.] Some fragments have also been preserved by Stobaeus.

The best edition of all the remains of Epictetus is that by Schweighaeuser, in six volumes, Leipzig, 1799. The same editor has published the Enchiridion, together with the Tablet of Cebes, in a separate volume. Coray published an edition of the Enchiridion, with a French translation by another hand, in the seventh volume of the Parerga of his Bibliotheca Graeca, Paris, 1826, 8vo. There is an English translation of the Enchiridion, or Manual, by Mrs. Carter. (Bayle's *Dictionary*; Fabricius *Bibliotheca Graeca*, ed. Harles, vol. v. p. 64.)

EPICU'RUS was born in the year 341 B.C., seven years after the death of Plato. He was born in the island of Samos, whither his father had gone from Athens in the year 352 B.C., among 2000 colonists then sent out by the Athenians. (Strab., xiv., p. 638.) He was however an Athenian born, belonging to the demus Gargettus, and to the tribe Ægeis. His father Neocles is said to have been a schoolmaster, and his mother Chaerestrata to have practised arts of magic, in which it was afterwards made a charge against Epicurus that, when he was young, he assisted her. (Diog. Laert., x. 4.) Having passed his early years in Samos and Teos, Epicurus went to Athens at the age of eighteen. We are told that he had begun to study philosophy when only fourteen, having been incited thereto by a desire, which the teachers whom he had applied to had failed to satisfy, of understanding Hesiod's description of chaos; and that he began with the writings of Democritus. In Samos he is said to have received lessons from Pamphilus, a follower of Plato. (Suidas; Cic. *de Nat. Deor.*, i. 26.) At the time when Epicurus arrived in Athens, Xenocrates was teaching in the academy, and Theophrastus in the Lyceum; and we may suppose that he did not fail to avail himself of the opportunities of instruction which were thus within his reach. Indeed it was stated by Demetrius Magnes (Diog. Laert., x. 13) that Epicurus was a pupil of Xenocrates. He is also said, on the testimony of Apollodorus, to have received lessons from Lysiphanes and Praxiphanes; and again it is stated that he was a pupil of Nausiphanes. (Id., x. 14; Suid.) It was however Epicurus's wont to boast that he had learnt from no man but himself.

On the occasion of his first visit to Athens, Epicurus stayed there for a very short time. He left it in consequence of the measures taken by Perdiccas after the death of Alexander the Great, and went to Colophon to join his father. In his thirty-second year, 310 B.C., he went to Mitylene, where he set up a school. Staying only one year at Mitylene, he next went to Lampsacus, where he taught for four years. He returned to Athens in the year 306 B.C.; and now founded the school which ever after was named from him. He purchased a garden for 80 minae, wherein he might live with his disciples and deliver his lessons, and henceforth remained in Athens, with the exception only of two or three visits to his friends in Asia Minor, until his death in the year 270 B.C. The disease which brought on his death was the stone. He was in his seventy-second year when he died, and he had been then settled in Athens as a teacher for thirty-six years.

Epicurus is said by Diogenes Laertius (x. 9) to have had so many friends 'that even whole cities could not contain them.' Pupils came to him from distant places, very many from Lampsacus; and while men often deserted other schools to join that of Epicurus, there were only two instances at most of Epicurus being deserted for any other teacher. So remarkably was this the case, (and it continued to be so as long as the Epicurean school lasted,) that it is related as a question put to Arcesilaus, 'why men change from other sects to that of the Epicureans, but never leave this?' (Diog. Laert., iv. 43.) Epicurus and his pupils lived together, in the garden which has been mentioned, in a state of friendship, which, as it is usually represented, could not be surpassed; abstaining from putting their properties together, and enjoying them in common, for the quaint yet significant reason that such a plan implied mutual distrust. The friendship subsisting between Epicurus and his pupils is commemorated by Cicero (*De Fin.*, i. 20). In this garden too they lived in the most frugal and virtuous manner, though it was the delight of the enemies of Epicurus to represent it differently, and though Timocrates, who had once been his pupil, and had abandoned him, spread such stories as that Epicurus used to vomit twice a day after a surfeit, and that many immodest women were inmates of the garden. (Diog. Laert., x. 6, 7.) An inscription over the gate of the garden told him who might be disposed to enter, that barley-cakes and water would be the fare provided for him (Senec., *Ep.* 31); and such was the chastity of Epicurus, that one of his principal opponents, Chrysippus, endeavoured to accouht for it, so as to deny him any merit, by saying that he was without passions. (Stob. *Serm.* 117.) Epicurus did not marry, in order that he might be able to prosecute philosophy with less interruption. His most attached friends and pupils were Hermachus of Mitylene, whom he appointed by will to succeed him as master of the school; Metrodorus, who wrote several books in defence of his system, and for whose children Epicurus in his will liberally provided; and Polyænus. Epicurus's three brothers, Neocles, Chæredemus, and Aristobulus, followed his philosophy; as also one of his servants, Mys, whom at his death he made free. Besides the garden in Athens, from which the followers of Epicurus in succeeding time came to be named the philosophers of the garden (Juv. *Sat.* xiii. 122, xiv. 319), Epicurus possessed a house in Melite, a village near Athens, to which he used often to retire with his friends. On his death, he left this house, together with the garden, to Hermachus, as head of the school, to be left by him again to whomsoever might be his successor.

Epicurus divided the whole field of knowledge into three parts, to which he gave the names respectively of *canonics*, *physics*, and *ethics*. The first two were subordinate to the third. The end of all knowledge, of ethics directly or immediately, of canonics and physics indirectly or mediately through ethics, was, according to Epicurus, to increase the happiness of man.

Canonics, which was a subject altogether introductory both to physics and ethics, treated of the means by which knowledge, both physical and ethical, was obtained, and of the conditions or (as they were called by Epicurus) *criteria* of truth. These conditions or *criteria* were, according to him, sensations (αἰσθήσεις), ideas or imaginations (προλήψεις), and affections (πάθη). From these three sorts of consciousness we get all our knowledge. What Epicurus then called canonics, viewed in relation to physics and ethics, is, viewed absolutely or in itself, psychology. Epicurus seems to have explained rightly the dependence of ideas upon sensations (Diog. Laert., x., 33); but in accounting for sensations, he, like Democritus, left the path of sound psychology, and introduced the fanciful hypothesis of emanations from bodies.

In physics he trod pretty closely in the footsteps of Democritus [DEMOCRITUS]; so much so that he was accused of taking his atomic cosmology from that philosopher without acknowledgment. He made very few and unimportant alterations; and of these Cicero remarks (*De Fin.* i. 6), 'Democrito adjicit perpauca mutans, sed ita ut ea quæ corrigere vult mihi quidem depravare videatur.' According to Epicurus, as also to Democritus and Leucippus before him, the universe consists of two parts, matter and space, or vacuum, in which matter exists and moves; and all matter, of every kind and form, is reducible to certain indivisible particles, atoms, which are eternal. These atoms, moving, according to a natural tendency, straight downwards, and also obliquely, have thereby come to form the different bodies which are found in the world, and which differ, in kind and shape, according as the atoms are differently placed in respect of one another. It is clear that in this system a creator is dispensed with; and indeed Epicurus, here again following Democritus, set about to prove, in an *à priori* way, that this creator could not exist, inasmuch as nothing could arise out of nothing, any more than it could utterly perish and become nothing. The atoms have existed always, and always will exist; and all the various physical phenomena are brought about, from time to time, by their various motions.

It remains to speak of the Epicurean system of ethics. Setting out from the two facts, that man is susceptible of pleasure and pain, and that he seeks the one and avoids the other, Epicurus propounded that it is a man's duty to endeavour to increase to the utmost his pleasures and diminish to the utmost his pains; choosing that which tends to pleasure rather than that which tends to pain, and that which tends to a greater pleasure or to a lesser pain, rather than that which tends respectively to a lesser pleasure or to a greater pain. He used the terms pleasure and pain in the most comprehensive way, as including pleasure and pain both of mind and of body; and he esteemed the pleasures and pains of the mind as incomparably greater than those of the body. Making, then, good and evil or virtue and vice depend on a tendency to increase pleasure and diminish pain, or the opposite, he arrived, as he easily might do, at the several virtues to be inculcated and vices to be denounced. And when he got thus far, even his adversaries had nothing to say against him. It is strange that they should have continued to revile the principle, no matter by what name it might be called, when they saw that it was a principle that led to truth. But even in our own age and country the same cry has been raised; and men, ignorant of the principles of the antient and of the modern philosopher alike, have endeavoured, by bringing to bear on it as a hard name the name Epicurean, to crush the philosophy of Bentham.

Though Epicurus dispensed with a Divine Being as creator of the world, he yet did not deny the existence of gods. That there was an inconsistency in this is obvious. But he professed that the universal prevalence of the idea of gods was sufficient to prove that they existed; and thinking it necessary to derive these ideas, like all other ideas, from sensations, he imagined that the gods were beings of human form, hovering about in the air, and made known to men by the customary emanations. He believed that these gods were eternal and supremely happy, living in a state of quiet, and meddling not with the affairs of the world. He contended that they were to be worshipped on account of the excellence of their nature, not because they could do men either good or harm. (Cic. *De Nat. Deor.* i. 41; Senec. *De Benef.* iv. 19.)

The two chief sources of knowledge concerning the doctrines of Epicurus are the tenth book of Diogenes Laertius, and the poem of Lucretius 'De Rerum Naturâ.' In the first of these are letters from Epicurus himself to three of his friends, which give a brief account of all the parts of his system. Information is furnished also by the writings of Cicero, principally the 'De Finibus' and the 'De Naturâ Deorum;' by those of Seneca; and the treatise of Plutarch entitled 'Against Colotes.'

Epicurus was, according to Diogenes Laertius, a more voluminous writer than any other philosopher, having written as many as 300 volumes, in all of which he is said to have studiously avoided making quotations. All that now remains of his works are the letters contained in the tenth book of Diogenes Laertius, and parts of two books of his treatise on Nature (περὶ φύσεως), which were discovered at Herculaneum. The last were published at Leipzig in 1818, being edited by Orelli. A critical edition of the first two letters of Epicurus was edited by J. Glo. Schneider, Leipzig, 1813.

Diogenes Laertius is the principal authority for the life of Epicurus; brief and incidental notices are also supplied by Suidas, Cicero, Seneca, and Plutarch. There is an account of the life and defence of the character of Epicurus, in eight books, by Gassendi (Lugd. Bat. 1647), and a life by a Frenchman of the name of Rondel (Par. 1679). It is unnecessary to mention the accounts given in Fabricius, Bayle, and all the common histories of philosophy.

The Epicurean school was carried on, after Hermarchus, by Polystratus and many others, concerning whom nothing particular is known; and the doctrines which Epicurus had taught underwent few modifications. When introduced among the Romans, these doctrines, though very much opposed, were yet adopted by many distinguished men, as Lucretius, Atticus, Horace; and under the emperors, Pliny the Younger and Lucian of Samosata were Epicureans. A list of Epicureans among the Greeks and Romans will be found in Fabricius, 'Bibliotheca Græca,' ed. Harles, vol. iii. p. 598-614.

EPICYCLE, a circle, the centre of which is carried round upon another circle: a term of the PTOLEMAIC HYPOTHESIS.

EPICYCLOID. [TROCHOIDAL CURVES.]

EPIDAURUS, a celebrated city of antient Greece, situated on the eastern coast of Argolis, on a small bay in the Saronic gulf and surrounded by mountains on the land side. (Strabo, p. 374.) Its more antient name was Epicarus, and its earliest inhabitants were Carians, who were subsequently joined by some Ionians from Attica. (Aristot. apud Strab.) When the Dorians got possession of Argos, Epidaurus yielded without resistance to them, and admitted a Dorian colony under Deiphontes. (Pausan. ii. 26, 1.) The constitution of Epidaurus was originally monarchical; in the time of Periander of Corinth his father-in-law, Procles, was tyrant of Epidaurus. (Herod. iii. 50.) Afterwards the government was aristocratical; the chief magistrates were called Artynæ, or Artyni, as at Argos (Thucyd. v. 47), and were the presidents of a council of one hundred and eighty; the common people were termed *konipodes* (κονίποδες), or dusty feet, in allusion to their agricultural pursuits. (Plutarch, *Quæst. Gr.* 1.) Epidaurus was the mother-city of Ægina and Cos, the former of which was once dependent upon it. (Strabo, p. 375.) As the chief seat of the worship of Æsculapius, Epidaurus was for a long period a highly important place. The temple of Æsculapius was situated at the upper end of a valley about five miles from the city, and was one of the richest and most renowned sanctuaries in Greece. In 293 B.C. it was so celebrated that during a pestilence at Rome a deputation was sent from that city to implore the aid of the Epidaurian god. (Liv. x. c. 47.) The temple was always crowded with invalids, and the priests, who were also physicians, contrived to keep up its reputation, for the walls were covered with tablets declaring the cures which they had wrought, even in the time of Strabo. Near the temple was a remarkably beautiful theatre, built by Polycleitus (Pausan. ii. 27, 5), which is in better preservation than any other theatre in Greece, except that at Tramvizos, near Joannina, and was capable of containing 12,000 spectators. Of the temple itself and the other buildings mentioned by Pausanias there are but few remains. (Leake's *Morea*, vol. ii., p. 424.) Epidaurus sent ten ships to Salamis, and 800 hoplites to Platæa. (Herod. viii. 1, 46, ix. 28.) The inhabitants were for a long time the allies of Sparta. (Thucyd. i. 105, ii. 56; Xen. *Hell.* iv. 2, 16, vii. 2, 2.) In the time of Aratus they joined the Achæan league. (Polyb. ii. 52.) The territory of Epidaurus was covered with vineyards in the time of Homer (*Il.* ii. 561), and the vine is still cultivated on the site (Leake, *Morea*, ii. p. 430), which is indicated by a small village called Pidhavro.

There were two other cities of this name; one in Laconia, called Epidaurus Limera, which had also a well-known temple of Æsculapius. There are still some remains of the fortifications. (Leake's *Morea*, i. p. 211.) This Epidaurus had a capital harbour, from which, according to Apollodorus, it derived its name Limera. (Strabo, p. 368.) The third Epidaurus was a maritime city of Illyria, mentioned by Hirtius. (*De Bello Alexandrino*, c. 44.)

Coin of Epidaurus.

British Museum. Actual Size. Silver. Weight, 36¾ grains.

EPIDEMIC (ἐπιδήμιος, *epidemius*; from ἐπὶ, in the sense of 'among' or 'through,' and δῆμος, 'people') diseases are those which prevail among a large portion of the people of a country, rage for a certain time and then gradually diminish and disappear, to return again at periods more or less remote. Thus cholera and influenza lately prevailed as epidemic diseases in this country; and the continued fevers called synochus and typhus, and what are termed the eruptive fevers, as scarlet fever, the small-pox, the measles, frequently prevail as epidemics in different parts of the country. It is essential to the medical notion of an epidemic disease that it be dependent on some common and widely-extended cause, of a temporary in contradistinction to a persistent nature. [ENDEMIC.]

EPIDENDRUM, an old name for all the orchidaceous plants which grow upon the branches of trees, and which are now called Epiphytes. [EPIPHYTES.] In its modern sense, it is restricted to a considerable genus of the order with the labellum united to the column, and four pollen masses adhering to as many little straps bent back upon them. Some of them are showy and interesting, particularly E. Skinneri, crassifolium, radiatum, aromaticum, bifidum, atropurpureum; but many are inconspicuous and of no importance except to botanists.

EPIDERMIS, the external covering of the skin, commonly called cuticle. [SKIN.]

EPIDOTE (*Thallite*, *Pistacite*), a mineral which occurs crystallized, massive, and granular. The primary form of the crystal is an oblique rhombic prism, variously terminated and longitudinally striated. Its colour is of various shades of green, greenish grey, brownish yellow, and blackish red. The streak is greyish-white. Specific gravity, 3.425 to 3.45. It is transparent or opaque. Lustre vitreous. Hardness, 6.0, 7.0. Fracture uneven. The massive varieties are amorphous; structure granular, compact, or fibrous. Before the blowpipe it fuses at the extreme points, then intumesces, but does not fuse even at a very high temperature. Epidote occurs in many parts of Europe, as in Norway, Switzerland, France, and England, and also in North America and the East Indies. According to Vauquelin, it consists of

Silica . .	37
Alumina . .	21
Lime . .	15
Oxide of iron .	24
Oxide of manganese	1·5
	98·5

EPIGRAM (Ἐπίγραμμα, *Epigramma*; from the Greek ἐπὶ, *on*, and γράφειν, *write*), in its proper sense, is—a writing on—an inscription; whence it comes to signify a short poem, such as might be comprised within the limits of an inscription. For an account of the class of poems called epigrams by the Greeks, see ANTHOLOGY; they are dedicatory, descriptive, amatory, elegiac; rarely humorous or satirical; and their merit consists 'in the justness of a single thought, conveyed in harmonious language.' (*Preface to Bland and Merivale's Anthology.*) Much of early Greek history was preserved in epigrams, to which Herodotus and Thucydides often refer; as for instance those concerning the battle of Thermopylæ (Herod. vii. 228), one of which is thus literally translated: 'Here once four thousand from Peloponnesus fought with three millions.'

The Latin epigram approaches nearer to the English acceptation of the term, being much oftener dependent for its point upon humour and personality. The most distinguished Latin epigrammatists are Catullus and Martial, in whom there is much wit, disfigured by much scurrility and obscenity; but many of the epigrams of Martial are epigrams in the Greek sense, and some of them are characterized by a propriety of thought and felicity of expression that could not easily be surpassed. The Latin Anthology of Peter Burman the younger contains a large collection of epigrams, by numerous authors, of which many resemble in simplicity the Greek epigrams.

In English the word signifies a short poem, which, to be good in its kind, must be clear, concise, and elegant in expression, and must contain a point, *i.e.* some striking and unexpected turn of thought. Whether it be humorous or serious is indifferent. The following terse and elegant compliment addressed by Pope to Lord Chesterfield, on being asked to write with that nobleman's pencil, may serve as well as any for a specimen:—

Accept a miracle instead of wit,
See two dull lines by Stanhope's pencil writ.

EPILEPSY, *epilepsia* (ἐπίληψις), 'a seizing.' Synonymes: *morbus divinus, herculeus, comitialis, caducus; falling sickness.* Sudden abolition of sensation and consciousness, with convulsions [CONVULSION] of the muscles of voluntary motion, ending in a state of sopor or apparent sleep, the attack recurring in paroxysms more or less regular. The attack of epilepsy is usually quite sudden. The person, while in his ordinary health, and perhaps engaged in his usual occupation, utters a piercing scream. If standing, he falls to the ground, where he lies for a moment in a state of extreme rigidity, almost amounting to tetanic stiffness; but this state is quickly succeeded by convulsions, which variously agitate the limbs and the trunk of the body. The head is generally thrown backwards; the eyes are open, fixed, and staring; the pupils are dilated; the vessels of the head and neck are swollen, rendering the countenance flushed, and sometimes of a dusky hue; the muscles of the face are in violent action, producing frightful distortions of the countenance; the muscles that move the lower jaw close the mouth with violence, producing gnashing of the teeth; the tongue, which is swollen and livid, is thrust out forcibly between the teeth, and is often grievously wounded; the arms are sometimes tossed violently about the chest, or struck against it; the hands and fingers are in a state of rapid alternation, between the motions of flexion and extension; the lower extremities are agitated in a similar manner; the thumbs are drawn inwards, and the toes incurved; and a quantity of frothy saliva flows from the mouth, which is often bloody from the wounds inflicted on the tongue. The muscles on one side of the body are commonly more violently agitated than those of the other. Several cases are on record in which the muscular contractions were so violent that the bones of the limbs were broken, the teeth fractured, and the joints dislocated. Generally the convulsions have for a few moments some remission, when they are again suddenly renewed with great violence. The breathing is disordered in consequence of the convulsion of the muscles of respiration. At first heavy and difficult as if a load were placed upon the chest, it becomes at length quick, short, irregular, and sterterous, and is often accompanied with sighing and moaning. The diaphragm, the muscles of the abdomen, and the muscular fibres of the bladder, contract with so much violence, that the fæces and the urine are discharged involuntarily and with great force. The pulse, always difficult to be felt, is commonly quick and small; but it becomes distinct towards the end of the paroxysm, and is then more slow and languid. The action of the heart is irregular, tumultuous, and loud, and the carotids throb vehemently. After the contractions of the muscles have continued for some time, the convulsions diminish in violence, and at length cease altogether. Perspiration breaks out about the head, neck, and breast; the convulsive respiration is followed by sighs, and the spasms of the muscles by subsultus. The patient is now restored to a slight degree of consciousness; but, as if exhausted by the violence of the struggle, he soon sinks again into a state of profound insensibility, and lies in a deep sleep. During the state of sleep, the perspiration becomes copious and general over the whole body; the pulse fuller, softer, and slower, and the respiration freer and easier. After a time the person awakes, sometimes suddenly, but in general it is only by degrees that sensation, consciousness, and the power of motion return. Commonly there is no consciousness whatever of anything that has passed during the paroxysm. On coming out of the fit there is generally headache, and always languor. The convulsive stage may last from one or two minutes to fifteen or twenty, and the sleep from one to several hours. The duration of the whole paroxysm is generally from five to ten minutes; but often two or three attacks follow each other in such rapid succession, that the paroxysm seems to be protracted for several hours. Occasionally death takes place unexpectedly in the midst of the fit, either in consequence of injury inflicted on the brain by congestion of the cerebral blood-vessels, or by the suspension of the respiration through the spasm of the muscles of the larynx, which close the opening of the glottis so completely and for so long a time as to induce the state of asphyxia.

Such are the general circumstances which accompany an epileptic attack, and the general form of the disease is pretty much the same in all the persons afflicted by it; the chief difference is in the slightness or severity of the phenomena, in which there is every possible variety, from an attack so severe as to produce instantaneous death to one which is so slight that it can scarcely be perceived. Sometimes, for example, instead of the regular and violent fit just described, the seizure consists merely of loss of consciousness, slight rigidity, spasms or convulsions of a few muscles or of a single limb, the attack lasting only a minute or two. At other times the patient is seized with sickness or a sensation of faintness, the sight becomes dim, the recollection imperfect, and the power of voluntary motion so far impaired, that the person slips from his chair, or falls from his horse, and lies on the ground insensible, pale, perspiring, but without convulsions. Or the attack may be so slight that consciousness is not wholly lost; but the mind becomes confused, the power of articulation suddenly diminished, and instead of finishing the sentence he was uttering, the person continues to mumble for half a minute or a minute the last words he was attempting to speak, in a slow, monotonous, gibbering manner; and then recovering, he takes up the thread of his discourse, being soon aware of an interruption of consciousness, which interruption there is often an effort to conceal. This state is described by the persons subject to it as one of great mental distress and depression, like a frightful dream: they feel perplexed and afflicted by an imperfect reminiscence of some overwhelming calamity, or a sense of remorse for which they cannot assign a cause. A paroxysm of this kind is like a sudden mood of extreme melancholy, and such is the impression that the countenance of the patient, which is full of sadness, makes upon the spectator. These slighter paroxysms may recur only at very distant intervals; but they more commonly return often, and sometimes three or four times a day.

The return of the regular epileptic paroxysm is exceedingly various in different individuals. Several years may intervene between the seizures; or they may recur once every month, week, or day. It is stated that they sometimes recur periodically, and with remarkable exactness to the very day; once a year, or once a month. When they recur monthly, and observe a stated day, that day sometimes coincides with the new or full moon, a coincidence to which great importance was attached in former times. The interval of a lunar month is more commonly noticed among females, from the connexion of the disease with the uterine functions. In some instances, the paroxysms occur every week, on the same day; and occasionally every day, or night, at the same hour; but they most frequently come on when first falling asleep, and are often for a time unsuspected or overlooked. Sometimes several slight seizures take place in one day; but their recurrence is often extremely irregular. When they are neglected, they usually either become more and more severe, or occur after shorter intervals. Consciousness and sensation being abolished, pain cannot be felt during the fit.

Though the epileptic attack usually comes on suddenly, yet it sometimes gives distinct warning of its approach. The symptoms premonitory of an epileptic fit are analogous to those which precede an attack of apoplexy [APOPLEXY], namely, headache, giddiness, flushing of the face, throbbing of the temples, drowsiness, sense of weight or heaviness in the head; flashes of light before the eyes, sleeplessness, fretfulness, irritability, or unusual cheerfulness and hilarity, disorders of the digestive organs, as voracious appetite, sickness, vomiting, constipation, or diarrhœa. But there is a peculiar sensation, termed the *aura epileptica*, of which many epileptics are conscious immediately before the fit. This consists of a feeling as if something were moving in some part of the limbs, or trunk of the body, and creeping thence upwards towards the head. Sometimes it is described as a sensation of a current of air, a stream of water, or a slight convulsive tremor; at other times no distinct idea can be given of the feeling further than that it is a sensation of something moving along. This remarkable sensation does not appear to follow very distinctly the course of a nerve, but it seems to pass along the integuments. When it reaches the head, the patient is instantaneously deprived of sense, and falls down in convulsions. The sensation arises in different parts of the body, in the toe, foot, leg, and groin; in the finger, hand, and arm; at the bottom of the spine; in the uterus, loins, abdomen, and chest. But in the great majority of cases, the attack of epilepsy is preceded by no such warning; and even where the premonitory symptoms do exist, the attack does not by any means always follow.

Epilepsy rarely occurs in a person otherwise in sound health. Out of three hundred cases, the early history of each of which was carefully investigated, very few had been perfectly well previously to the accession of the disease. Convulsions during the first dentition, eruptions on the skin, mental excitement, diseases of the glands, chorea, hysteria, tremor, cramp, vertigo, palpitation, headache, fainting, bleeding from the nose, precede the first epileptic attack, and perhaps may be considered, at least in part, as predisposing causes of the malady.

As this disease is often long preceded by other maladies before the actual seizure, so, after it has subsisted for some time, it induces a peculiar state of the constitution, and more especially, it would appear, in the nervous system, which predisposes to the recurrence of the attack, and the signs of which internal state are manifest in a peculiar expression of the external features. The eyelids become swollen; the eyes prominent and unsteady; the lids tumid; the cheeks pale, the lips thick; and the individual features, however originally beautiful, grow coarse, and lose their fine expression. The steadiness and energy of the mind progressively diminish; the purpose becomes irresolute, and the power of continuous application for the accomplishment of a given object is lost. Instances are recorded in which, though the disease recurred frequently for a long series of years, neither the memory nor any other mental faculty appeared to be impaired; but this is exceedingly rare. In general, in the severe and protracted cases, the following melancholy description, given by an ancient author, is but too correct: 'If the disease be of long duration the patients become torpid, languid, and dejected; they avoid the sight and the society of men; time does not afford any mitigation of their sufferings; they are often oppressed with wakefulness, and when they do sleep they are terrified with horrible dreams; they loathe food, and digest with difficulty; their natural colour disappears, and changes to a leaden hue; they have a difficulty of comprehension, on account of torpor of mind and of sense; they are dull of hearing, are affected with a singing of the ears and a confused sound in the head; the tongue is unable to do its office, either on account of the nature of the disease, or from injuries which it may have received in the paroxysms; they are agitated by convulsions, and sometimes the mind is so disturbed by the complaint, that persons labouring under it become fatuous or idiotic.' It is an old observation that those who become insane at an early age are first epileptic; and it is certain that epilepsy often terminates in mania, a violent attack of mania often immediately following the epileptic paroxysm. 'Of 289 epileptics in the Salpêtrière, in 1813, 80 were maniacal, and 56 in various states of partial alienation and imbecility. In 1822, out of 339 cases in the same hospital there were 12 monomaniacs, 30 maniacs, 34 furious maniacs, 129 insane for some time after the paroxysms, 16 constantly insane, 8 idiots, 50 upon the whole reasonable, but with impaired memories, and liable to occasional slight delirium and tendency to insanity, and 60 without aberration of intellect, but irritable, capricious, obstinate, and presenting something singular in their characters.' In this country a very common termination of epilepsy is apoplexy or paralysis.

Authors commonly divide epilepsy into two species: first, idiopathic, where the disease depends on some primary affection of the brain, and secondly, sympathic, in which it depends on an affection of some remote part, as the stomach, the liver, the bowels, the generative organs, the circulating system, &c.

The state of the brain on which epilepsy depends is unknown. Dissection shows that the brain of the epileptic is seldom sound; but much as this subject has been investigated, little light has hitherto been shed upon the pathology of the brain as connected with this disease. The most common morbid appearances are the thickening of the bones of the skull; spicula or morbid growths of the bone from the inner table of the skull; vascular turgescence, or inflammation of the membranes of the brain; preternatural hardness or softening of the substance of the brain and of the spinal cord; effusion of serum, blood, jelly, or pus between the membranes, upon the surface or into the ventricles of the brain; tumors or morbid growths in its substance; adventitious deposits, as tubercles, or parasitic animals, as hydatids. Recent researches appear to indicate that the parts of the brain which most commonly undergo morbid changes of structure in this disease are the parts in the neighbourhood of the sphenoid bone, and especially the pineal and the pituitary glands, and particularly the latter. But occasionally, where violent epilepsy has existed during life, the most careful examination of the brain after death has led to the discovery of no appreciable change in its structure; while even the morbid appearances which are manifest are often observed to be present without being accompanied with epilepsy; so that the relation between any known morbid change in the structure of the brain and epilepsy is not yet certainly established. It follows, as has been stated, that nothing is really known of that condition of the brain which causes epilepsy.

But many of the causes of the malady are well ascertained, and the knowledge of these is of great importance in the prevention and cure of the disease. It is conceived that there is a constitutional predisposition to epilepsy, although it does not seem easy to assign with exactness in what this predisposition exists. Several of the exciting causes are weak impressions which are applied to most persons with little or no effect. 'I conclude therefore,' says Cullen, 'that the persons affected by those causes are more easily moved than others, and therefore that in this case a certain mobility gives the predisposition. It is clear that there is a greater mobility of constitution in some persons than in others, as is manifest in the state of the mind. If a person is readily elated by hope and as easily depressed by fear, and passes equally and quickly from the one state to the other; if he is easily pleased and prone to gaiety, and as easily provoked to anger and rendered peevish; if liable from slight impressions to strong emotions, but transient ones of mind; this is the boyish temperament, *qui colligit ac ponit temere, et mutatur in horas*; this is the *varium et mutabile femina*; and, both in the boy and woman, every one perceives and acknowledges a mobility of mind. But this is necessarily connected with an analogous state of the brain; that is, with a mobility, in respect of any impression, and therefore liable to a ready alternation of excitement and collapse, and of both in a considerable degree. There is therefore, in certain persons, a mobility of constitution, generally derived from the state of original stamina, and more exquisite at a certain period of life than at others; but sometimes arising from, and particularly modified by, occurrences in the course of life. And this mobility consists in a greater degree of either sensibility or irritability.' Dr. Cheyne conceives that epilepsy is as certain a manifestation of the strumous diathesis as tubercular consumption, psoas abscess, hereditary insanity, or certain congenital malformations or defects of organization which are inherited only from scrofulous parents. Epileptic patients are of the habit of body in which scrofula occurs. It is an hereditary disease. If due inquiry be made, it will generally be found that although the direct progenitors, father or mother, may have escaped, yet that some member of the family, uncle or aunt, grandfather or grandmother, has been subject to fits; and if epilepsy occur for the first time in a family it is probably in consequence of the strumous diathesis having been exalted by the intermarriage of two persons inheritors of that condition or tendency of the constitution, and which it has been in a yet more remarkable degree if the parents were of the same blood and nearly related; we may then expect, if an epileptic patient has several brothers and sisters, that his case will not be a solitary one in the family.

The exciting causes consist of two classes, those which act by exciting the energies of the brain, and those which act by depressing the brain. Those which act by over-stimulating the brain are mechanical, chemical, and mental stimulants, and the peculiar stimulus of over-distention; as sharp-pointed ossifications, arising either from the internal surface of the cranium or formed in the membranes of the brain; powerful mental emotions, such as joy and anger; congestion of the blood-vessels of the brain; suppressed discharges; violent exercise; too large a quantity of highly nutritious food or of stimulating drink. 'I have observed,' says Fothergill, 'that epileptics are often extremely incautious with respect to diet; that children highly indulged are liable to the disease; that in every other period of juvenescence, and in middle-aged adults, if they were attacked with the disease, it was when they had either committed some excesses, or by one means or another were plethoric, and that in habits subject to epilepsy, the disease seldom recurred without either an habitual indulgence in eating or a neglect of necessary exercise.'

But the very opposite causes, those which manifestly weaken the energy of the brain, occur in epilepsy, as hemorrhage, whether spontaneous or artificial; terror, horror, disgust; any powerful and disagreeable sensations, and especially certain disagreeable odours; excessive evacuations, great fatigue, inanition, and sedative poisons.

The medical treatment of a case of epilepsy must of course differ essentially according as it is idiopathic or sympathic, and connected with a plethoric and robust, or debilitated and exhausted state of the system. Unless he previously ascertain the condition of the brain and spinal cord, or the nature of the affection of the remote organ in sympathy with which the brain is suffering, the practitioner must work entirely in the dark, and must be liable to adopt the very opposite course of treatment to that which the case really requires. When the appropriate remedies are judiciously employed, and the proper regimen is strictly adhered to, epilepsy is often permanently cured, and the suffering is greatly mitigated even in those forms of the disease which do not admit of cure. Dr. Cheyne has laid down some excellent rules for the management of epileptic patients, of which, as they are of a popular nature, and applicable to the great majority of cases, we give the substance.

In prescribing a rule of diet suitable to all epileptics, moderation in quantity and simplicity in the preparation of the food are indispensable points. The diet best calculated to preserve an individual liable to scrofula from an attack of that disease is best suited to a patient liable to epilepsy. Fermented liquors should in general be altogether withheld. Flesh-meat ought to form the principal part of one if not two meals in the day; and milk, if it do not retard digestion, which it is less liable to do when fermented liquors are laid aside, is the article next in value. The epileptic ought to be trained so as to be in good wind, so as to put his muscles in a state of the utmost strength and firmness. Epileptics should be put under a regular course of training like the athletic of antient, and the gentlemen of the fancy in modern times. When the patient leaves his bed in the morning, he may have a rusk or a slice of toasted bread with an egg beat up in a teacup full of warm water; then let him dress, make all needful arrangements, and walk three or four miles. Two hours or more after he has left his bed, let him have his second meal, milk or cream in water, or cocoa with bread a day old and butter. Rest for three hours after breakfast. This will be the best time to devote to business or education. Then he must again walk, if an adult possessed of sufficient vigour, from five to eight miles. At from five to six hours after his second meal, let him have a third, consisting of meat of the best quality, mutton, poultry, game, or very tender beef, roasted or boiled, of which an adult must not eat more than six ounces; bread, and one moderate helping of tender well-boiled vegetables; of drink, not more than a common tumbler full of distilled water, Seltzer water, with a little milk, or toast and water. Then rest for two hours; that is, stroll in a garden, read an amusing book, or engage in any occupation which will not raise the pulse by one beat; then resume more active exercise for an hour or two. In five or six hours after dinner, a light supper may be taken, consisting of not more than four ounces of meat with bread, or of a cup of milk with a water biscuit. The rest of the evening may be spent in cheerful society, in a large airy room, not over lighted nor over heated, but sufficiently warm to prevent that chill which in the latter part of the day often follows very active exercise; and every occupation by which the mind is depressed or is excited, and thereby subsequently exhausted, must be avoided. The patient must be in bed at eleven and up at six, nothing in general being more hurtful to epileptics than sleep unnecessarily prolonged.

The scalp in all epileptics ought to be shaved once a week, and daily well rubbed with a flesh-brush after the tepid shower bath, or, what answers nearly as well, after pouring a flaggon of tepid water on the head inclined over a large basin. The patient may gradually bring himself to sleep without a night-cap and without curtains, with the shoulders and head raised and the feet well protected from the cold, in a chamber as large and airy as possible and without a fire.

A patient liable to epilepsy must not be permitted to ride nor to hold the reins in a carriage. The grates in all the apartments which he frequents ought to be guarded by a deep and strong fender: he ought to avoid the streets of a crowded city, in which the whirl of carriages, the tide of human beings, and the multiplicity and distraction of objects produce a vertiginous hurry of thought, which to him is ever dangerous. He ought not to walk near water. A fine young man of twenty came to an untimely end in his own garden, by falling into a runnel, in which he was drowned, although the water was not more than four inches deep.

If an attack of the disease come on while the patient is in his chamber, he ought immediately to be laid on his back on a bed, with an attendant standing on each side to prevent him from injury during the struggle. If he is much flushed, his head and shoulders ought to be elevated, the warmth of his extremities supported, while at the same time air is freely admitted into the room. All attempts to make him swallow or to stimulate the nostrils are improper. A medical practitioner ought to be sent for, and ought to remain in attendance while the struggle lasts. In a first attack, if the fit is severe, blood ought to be procured from the temporal artery, a precaution which will also be necessary in patients of an apoplectic diethesis whensoever they labour under a prolonged fit of apoplexy. (Cheyne, *Cyclopæd. of Pract. Med.*; Copland, *Dict. of Pract. Med.*; Prichard, *Diseases of the Nervous System*; Cooke, *Hist. and Method of Cure of the various Species of Epilepsy*.

EPILOGUE (ἐπίλογος, epilogus) (compounded of ἐπί, *on* or *after*, and λόγος, *speech*) signifies, in Greek, a summing up, the end or peroration of a discourse. In English it is applied only to the short poems or copies of verses (invariably, we believe, written in the heroic couplet) which formerly were commonly subjoined to new plays, and recited on the stage at their conclusion. An epilogue is usually written in a lively tone, with such allusions to the play, the author's circumstances, the news or fashions of the day, or other subjects of existing interest, as are thought likely to conciliate favour, and send the audience away in good humour. 'If it be true that good wine needs no bush, 'tis true that a good play needs no epilogue: yet to good wine they use good bushes, and good plays prove the better by the help of good epilogues.' (*As You Like It.*)

EPI'MACHUS. [PROMEROPIDÆ.]

EPIME'NIDES was born in the year 659 B.C. (Suidas), at Phæstus, in Crete, according to some accounts; or at Cnossus, according to others; at all events, he was a citizen of the latter place, though his father appears to have been a Phæstian. (Diog. Laërt., i. 109.) He passed his youth in solitary retirement, which is explained in the antient account as a supernatural sleep into which he fell when a youth, and did not awake till more than fifty years after, when he made his appearance among his fellow-citizens with long hair and a flowing beard, and with knowledge of medicine and natural history, which then appeared more than human. The event of his life for which he is best known, was his visit to Athens at the request of the inhabitants, in order to pave the way for the legislation of Solon by purifications and propitiatory sacrifices. These rites were calculated, according to the spirit of the age, to allay the feuds and party dissensions which prevailed there: and although what he enjoined was mostly of a religious nature (for instance, the sacrifice of a human victim, the consecration of a temple to the Eumenides, and of two altars to Hybris and Anædeia, the two evil powers which were exerting their influence on the Athenians), there can be little doubt but that his object was political, and that Solon's constitution would hardly have been accepted had it not been recommended and sanctioned by some person who like Epimenides, claimed from men little less than the veneration due to a superior being. The Athenians wished to reward Epimenides with wealth and public honours, but he refused to accept any remuneration, and only demanded a branch of the sacred olive-tree and a decree of perpetual friendship between Athens and his own country, Cnossus. Epimenides visited Athens about the year 596 B.C., and died soon after his return to Crete. He wrote a poem on the Argonautic expedition, and other works, which are entirely lost. For a more detailed account of this remarkable personage the reader is referred to C. F. Heinrich's *Epimenides aus Kreta*, Leipzig, 1801.

EPINAL, a town in France, the capital of the department of Vosges. It is on the bank of the Moselle, about 190 miles in a straight line, east by south of Paris, [illegible] miles by the road through Meaux, Château Thierry, Epernay, Châlons sur Marne, Bar sur Ornain (otherwise Bar le

Darney, Domremy, and Mirecourt; or 243 miles through Bar sur Ornain, Nancy, and Charmes.

No mention occurs of Epinal earlier than the end of the tenth century, when it was the residence of the bishops of Metz: the lordship however passed subsequently into the hands of the dukes of Lorraine. It was formerly well fortified, and had a fine castle; but the fortifications have been razed.

The town is situated at the foot of the chain of the Vosges, and in a district abounding with delightful situations. The rapid stream of the Moselle, whose clear and shallow waters here roll over a bed of large pebbles, divides the town into two unequal portions: the part on the right bank is called 'la Grande Ville;' it is at the foot of an eminence on which stand the ruins of the castle; the part on the left bank is called 'la Petite Ville;' it is on an island formed by the main channel of the Moselle, and a smaller arm of that river: on the left bank of this arm is a suburb, formerly named 'the Suburb of the Capuchins,' from a convent of the monks of that order. The streets of Epinal are well laid out. The office of the prefect is the finest edifice in the place; the court of justice is tolerably handsome; the church is of Gothic architecture, mingled with some parts in the style of a later age. There is a theatre; also an hospital on an eminence on the right of the Moselle. There are some public walks. The population in 1832 was 8610 for the town, or 9070 for the whole commune. The manufactures are lace, paper, and earthenware; and, in the neighbourhood, black tin, wrought iron, paper, earthenware, and leather. There are several establishments for the purposes of public instruction, a library of 17,000 volumes, a collection of paintings and antiquities, and a drawing-school.

The neighbourhood produces wheat, rye, oats, buckwheat, peas, lentils, Jerusalem artichokes, hemp, and flax: and trade is carried on in the town in grain, wine, oil, fir planks (for sawing which there are several yards round Epinal), linen yarn, linen cloth, and cattle. The arrondissement of Epinal had in 1832 a population of 91,578.

EPIPHA'NIUS, SAINT, a Christian bishop and author of the fourth century, was born of Jewish parents at a village called Besanduca, near Eleutheropolis, in Palestine. He spent his youth under the discipline of the Gnostics in Egypt, where he acquired a great fondness for the monkish asceticism then so prevalent in that country. Having become a zealous disciple of Hilarion, the patriarch of the monks of Palestine, he founded and long presided over a monastery near his native village. About the year 368 he was made bishop of Salamis, the metropolis of the island of Cyprus, where he continued about 36 years, and composed most of his writings. His spirit of opposition was especially excited by the Platonic doctrines of the learned and ingenious Origen, against which he wrote and preached with implacable bitterness. On this subject he hotly quarrelled, in 391, with John, bishop of Jerusalem, who favoured Origen's views; but he found in Theophilus, the violent bishop of Alexandria, a worthy coadjutor, who in 399 convened a council, and condemned all the works of Origen. Epiphanius himself then called a council in Cyprus A.D. 401, and reiterated this condemnation, after which he wrote to St. Chrysostom, then bishop of Constantinople, requesting him to do the same; and on finding this prelate disinclined to sanction his violent proceedings, he forthwith repaired to Constantinople for the purpose of exciting the bishops of that diocese to join in executing the decrees which his Cyprian council had issued; but having entered a church in the city in order to repeat his anathemas he was forewarned by Chrysostom of the illegality of his conduct, and was obliged to desist. Exasperated at this disappointment, he applied to the imperial court for assistance, where he soon embroiled himself with the Empress Eudoxia; for, on the occasion of her asking him to pray for the young Theodosius, who was dangerously ill, he replied that her son should not die provided she would not patronise the defenders of Origen. To this presumptuous message the empress indignantly answered, that her son's life was not in the power of Epiphanius, whose prayers were unable to save that of his own archdeacon, who had recently died. After thus vainly endeavouring to gratify his sectarian animosity, he resolved to return to Cyprus, when, according to Sozomen (lib. 8, cap. 15), the following farewell colloquy occurred between the bishop of Salamis and the bishop of Constantinople:—'I hope,' said Epiphanius to Chrysostom, 'you will never die a bishop.' Chrysostom, returning the compliment, replied with equal courtesy, 'I hope you will never get back to your own country;' and it is remarkable that each of these malevolent wishes was accomplished; for Chrysostom was deposed, and died in exile, and Epiphanius died at sea, on his passage to Cyprus, A.D. 403. His works in Greek were first printed in fol. at Basle, in 1544. Several editions, with a Latin translation by Cornarius, subsequently appeared at Basle and at Paris during the sixteenth century; but the best is by Petavius, who made a new Latin translation of the Greek text, and added a biography of the author and critical notes. This edition is in 2 vols. fol., Paris, 1622, and Cologne, 1682. In the 'Epiphanii Opuscula, ex editione Petavii,' are some very curious and valuable old prints. The principal works of Epiphanius are: 1. The Πανάριον, Panarion, or a treatise on Heresies, that is, peculiar sects (αἱρέσεις). This is the most important of the author's writings. It treats of 80 sects, from the time of Adam to the latter part of the fourth century. The first section of the first of the three books into which the treatise is divided contains an account of 20 heretical sects before the birth of Christ; the remaining portion is occupied with the description of 60 heresies of Christianity. 2. 'Anacephalaeosis,' or, an Epitome of the Panarion. 3. 'Ἀγκυρωτός, Ancoratus,' or, A Discourse on the Faith; explaining the Doctrine of the Trinity, Resurrection, &c., in confutation of the Pagans, Manichaeans, Sabellians, and Arians. 4. A Treatise on the ancient Weights, Measures, and Coins of the Jews, with a Catalogue of Canonical Scriptures. Besides these there are several treatises and epistles, some of which are falsely attributed to Epiphanius. (See Riveti *Crit. Sacr.* c. 38 and 39.)

Epiphanius was an austere and superstitious ascetic, and, as a bitter controversialist, he often resorts to very false arguments for the refutation of heretics. That his inaccuracy and credulity were equal to his religious zeal is apparent from his numerous mistakes in important historical facts, and his reliance on any false and foolish reports. He gravely relates the story of the seventy-two translators having been shut up each in a separate cell for the production of the Greek Septuagint version of the Hebrew Scriptures; and in the 'Panarion' (Heres. 39) he observes, that the Devil, before the coming of Christ, lay quietly by, in expectation of being pardoned; but that, finding no chance of salvation from the Saviour, he at once became fearfully refractory, and has ever since done his utmost to occasion all possible mischief to Christ and his church. Jerome admires Epiphanius for his skill in the Hebrew, Syriac, Egyptian, Greek, and Latin languages, and accordingly styles him, Pentaglottus (πεντάγλωττος), or the Five-tongued; but Scaliger calls him an ignorant man, who committed the greatest blunders, told the greatest falsehoods, and knew next to nothing about either Hebrew or Greek. However, his writings are of great value as containing numerous citations from curious works which are no longer extant. (Du Pin, *Bibliothèque Eccles.* tom. 2; Cave's *Lit. Hist.*; Bayle's *Dict.*; Dr. A. Clarke's *Succession of Sacred Literature.*)

EPIPHANY, from the Greek Ἐπιφάνεια (*Epiphaneia*), appearance, or manifestation, a church festival, celebrated on the twelfth day after Christmas, in commemoration of our Saviour's being manifested to the world by the appearance of a miraculous star; likewise denominated Twelfth Day. This day is said to have been first observed as a separate feast in the year 813. The customs of this day, though various in different countries, all agree in the same end, namely, to do honour to the eastern magi, or kings, who visited and made offerings to our Saviour at his birth. (Brady's *Clavis Calendaria*, 8vo., London, 1812, vol. i., p. 143; Brand's *Popular Antiq.*, 4to. edit., vol. i., p. 18.)

EPIPHYLLOSPERMOUS PLANTS, so called by the old botanists, because they bore their seed upon the back of their leaves. They are what have more recently been called dorsiferous ferns. [FILICES.]

EPIPHYTES are plants found growing upon other vegetables, adhering to their bark and rooting among the scanty soil that occupies their surface, in which respect they are distinguished from parasitical plants, which, like Misseltoe and the various species of Loranthus, strike their abortive roots into the wood, and flourish upon the blood of the individual to which they attach themselves. In this sense of the word, mosses, lichens, ferns, and plants of many other families, are epiphytes; but as in this country at the present day the word is principally employed with reference to those Orchidaceae which grow upon trees, it is to plants of that description that we propose to devote the present article.[*]

It had long been known, from the reports of travellers, that orchidaceous epiphytes were plants of extremely curious organization, and that great numbers were also remarkable for the singular beauty and fragrance of their flowers; but when imported into this country, their habits were found to be so unlike those of other plants, that no gardener could succeed in keeping them even alive for any considerable time, except in a very few instances; and it was not till about the year 1820 that the real method of managing them successfully began to be understood. About that time the late Mr. Cattley and the writer of this notice began to direct their attention to the subject with some success: since that period the difficulties of cultivating orchidaceous plants have been gradually disappearing, and at the present day they may be said to be almost entirely overcome; so that in the gardens of the duke of Devonshire at Chatsworth, of Mr. Bateman at Knypersley, of Lord Fitzwilliam at Wentworth, of Mr. Harrison of Liverpool, and of many other amateurs, they have acquired a beauty quite unknown to them in a wild state. Species which in their native woods yield no more than two or three of their curious blossoms in a cluster have been found to produce from nine to between twenty and thirty, and the whole order has in short been found willing to submit to domestication with as much advantage as has ever attended roses, hyacinths, tulips, or dahlias, — those well-known flowers which we have from time to time reclaimed from their wild habits, and by the arts of cultivation invested with a splendour of appearance that never could have been anticipated from their original appearance in a savage state. Previously to the year 1820 it is doubtful whether any garden in England could at any one time have produced twenty species of these plants, and now at least a thousand are successfully preserved in the collections of the Messrs. Loddiges, Rollisson, Knight, and other nurserymen near London.

We do not propose in this place to give any botanical account of these curious plants; for such particulars we refer to the article on ORCHIDACEÆ. Upon the present occasion we shall confine ourselves to an account of their natural habits, and of those methods of cultivation which appear to have met with so much success. In preparing the following account, we depend in part upon our own experience, in part upon the information contained in the writings of botanical travellers, and in part upon the useful communications which within the few last years have been made to the current horticultural publications, especially the 'Transactions of the Horticultural Society' and the 'Gardener's Magazine.'

Orchidaceous Epiphytes grow naturally upon trees in the recesses of tropical forests. They establish themselves upon the branches, and either vegetate amidst masses of decayed vegetable and animal matter, or cling by their long succulent grasping roots to the naked branches of trees, from which and the humid atmosphere together they exclusively derive their food. It appears from the testimony of Mr. Henchman that they are never found upon dead erect trees in forests; but if upon dead wood at all, then only upon fallen trunks, which, from their situation near the ground, are constantly damp. Such situations are, however, said to be by no means favourable to their growth. They will also flourish upon rocks and stones in hot and damp climates. Mr. W. Harrison of Rio Janeiro is said, by one of the Horticultural Society's collectors who visited him, to have cultivated with the most perfect success above seventy species upon a wall in his garden at Boto Fogo.

We even see some of them germinate and grow most luxuriantly in damp places, in the stove, upon the sides of the garden-pots, and among gravel; some genera, such as Brasavola, are even reported to prefer stones; and Dr. Wallich found them in all cases growing equally well in Nepaul upon trees and stones, provided the latter had a certain quantity of mould and moss adhering to them. In the botanic garden at Calcutta they are said to be cultivated with success in raised beds of solid brickwork, so contrived as to insure a perfect drainage; the soil being rich vegetable matter mixed with at least two-thirds small pebbles, and covered with a dense layer of moss. A certain quantity of shade seems, in many cases, essential to them, their natu- situation being in forests, or among the branches of wing trees. In Brazil numbers of them occupy damp woods and rich valleys, among vegetation of the most luxuriant description, by which they are embowered. Reinwardt describes others as inhabiting in great abundance those deep shady gloomy forests which form the lower zone of vegetation in Java, where the air is heavy and damp with vapours that cannot ascend, and where the thickness of the vegetation is really frightful; where, in short, heat, moisture, and a most extraordinarily deep and rich vegetable soil combine to produce wood of a fungus-like softness and an inconceivable abundance of twining plants and epiphytes. In those forests more especially where huge fig-trees constitute the principal part of the timber, intermingled with the most tropical forms of vegetation, such as sterculiaceæ, sapindaceæ, and artocarpeæ, tufts of orchidaceous plants abound, in company with araceæ, acanthaceæ, and zingiberaceæ.

In Nepaul Dr. Wallich states that orchidaceous epiphytes grow in company with ferns; and the thicker the forest, the more stately the trees, the richer and blacker the natural soil, the more profuse the orchidaceæ and ferns upon them. There they flourish by the sides of dripping springs, in deep shady recesses, in inconceivable quantity, and with an astonishing degree of luxuriance. It would however be a great error to suppose that it is only in very shady places that orchidaceous epiphytes appear. On the contrary, it is probable that the cases just cited are extreme, and that they more commonly prefer situations where the broken rays of the sun can readily reach them. Mr. John Henchman states (*Gardeners' Mag.* ii. 139) that he has observed in Demerara 'that orchidaceæ appear to rejoice in a light situation and a free circulation of the atmosphere; but are decidedly averse, with few exceptions, to exposure to the intense rays of the sun. We may except from this remark oncidium luridum, the catasetums, and a fine pseudo-bulb found on the Spanish Main (which I suppose to be an epidendrum), which seem not only to exist, but to rejoice, in exposure to the sun.' Mr. Bateman also found, from the report of his collector, Colley, that the situations in which they are most usually seen are those parts of a forest where old and broken wood occurs, or on the skirts of savannas. These savannas are large open breaks in the woods, covered with fine white sand, which has, at night, the appearance of snow. They contain also many low and stunted bushes. The orchidaceæ seem to like an airy and exposed dwelling-place, being found on the more prominent parts of a tree, and not in the shade, as is generally supposed. Mr. Colley only found in one instance an orchidaceous plant in the heart of a forest, and this was growing on the prostrate trunk of a tree so rotten as to fall to pieces when pressed with the foot. (*Gard. Mag.* ii. 4.)

This quite corresponds with the statements of travellers in Brazil, who speak of their occurring most abundantly in open glades of the forests, and on the faces of naked rocks, or on shaded banks, although they are also met with 'in sombre glades where heated vapours are incessantly circulating.'

Where the climate suits them, they are sometimes prodigiously numerous. Descourtilz, in his manuscripts, speaks of a whole tree being overrun with a single species; and Henchman also assures us that in Demerara masses of oncidium altissimum and maxillaria parkeri are to be seen, which would defy any attempt at intrusion. On the Spanish Main he saw the epiphyte commonly called the spread eagle, which will possibly prove an epidendrum, clasping enormous trees, and covering them from top to bottom; and he also met with two or three species, supposed to be maxillarias, which were growing with uncommon vigour. But, he adds, 'with the above exceptions, I have not found orchidaceæ growing in such quantities as it has been reported they do; often, as Mr. Bateman justly observes, single specimens only are to be obtained. This cannot be more strongly illustrated than the case of a beautiful oncidium, which I was happy enough to meet with on the Spanish Main; its leaves are nearly six inches in width, of a very firm texture, and possessing an uncommonly strong nerve; and though the plant, judging from the remains of the original stem, which had gradually decayed as the plant progressed, must have occupied its station for nearly half a century, yet I searched the neighbourhood in vain for another specimen, nor did I see another plant of it on the Main.'

This altogether corresponds with what we know of such plants in other countries, and with the general habit of the whole order, which is extremely local in the majority of cases.

Upon comparing the orchidaceous plants of Java, of Ceylon, and of the Burmese country, it is quite extraordinary how few species those countries possess in common; and the quantities of species found exclusively in every large collection are a confirmation of the same fact. Mr. Schomburgk assures us that in Guiana 'a river may be ascended for twenty miles without an orchidaceous plant being seen, while on a sudden turn of the stream, every tree becomes covered with them:' yet they do not appear to have a favourite aspect, for on some of the rivers which Mr. Colley visited he found them exclusively on the northern exposure, while on others they occupied the southern. The part of the tree on which they are principally found is as uncertain as their station. It is said that they love the loftiest branches, and are hardly found near the bottom, and M. Descourtilz confirms this statement by describing some of them as swinging in the air from the top of the old patriarchs of the forest, or exposed to all the violence of storms in the most exposed situations. But Mr. Henchman asserts that in Demerara at least they 'do not grow in such high situations upon trees as is generally supposed. Twenty or twenty-five feet is the greatest height, with few exceptions, at which I have seen them growing. Some of the bulbous epidendrums, the spread eagle plant, and oncidium papilio, attain a much greater height. The other oncidiums I have not seen growing above seven feet or eight feet from the ground, and generally on some of the small closely intertwined branches, and not on the stem or main branches of the tree. The various species of Gongora, Coryanthes, and Rodriguezia, are, almost without exception, found in the same position; while, again, the genera Maxillaria, [illegible], Epidendrum, Ceratochilus, Cattleya, Zygopetalum, Brassavola, Ornithidium, Camaridium, Pleurothallis, Brassia, Ornithocephalus, [illegible], Citrosmum, and many other genera supposed to be new, I have found always attached to the trunk or strong limbs of the tree, which they clasp with surprising tenacity. It may be also observed that rough and soft barked trees are favourite habitats of orchideae. The calabash tree, which has a peculiarly soft and woolly bark, often possesses many of the more minute species. Indeed, I sent home pieces of the calabash tree, about a foot long, on some of which were six and on others seven distinct species of orchideae.'

A high mean temperature throughout the year, and a climate either constantly humid or at least periodically so, are the atmospheric elements eminently favourable to the production of these plants. All those species which simply exist clinging by their roots to the branches of growing trees and probably others also, must necessarily derive their nourishment in a great measure, if not entirely, from the moisture, in a very elastic state, that surrounds them. And although nature seems in general to have provided for the continuance of their food by the construction of them with a cuticle only capable of parting by slow degrees with the fluid they receive by their roots, yet it is obviously requisite that they should be so situated as to be within reach of an abundant supply, not only at the time when they are growing, but also at all other times to a certain extent. Hence we find that the hottest countries if dry, and the dampest if cold, are destitute of them, while there is no instance of a country both hot and damp in which they are not plentiful. For example, in Africa they are unknown in its sandy deserts and parched atmosphere, notwithstanding the high temperature of that part of the world; yet they abound in Sierra Leone, where the climate is damp, and even at the Cape of Good Hope they occur not unfrequently in all that jungle district to the eastward of the Cape Town to which the name of Outeniqualand is applied.

In the West India Islands they exist in great quantities, particularly in Jamaica and Trinidad, not however so much on the coast as upon the lower ranges of hills. This is in conformity with their habits elsewhere; in those islands the air at the level of the sea is dry, while that of the mountains is humid. Captain Sabine found the air of the level of the sea at Trinidad indicate 5° of dryness, and that of Jamaica 7°; while the atmosphere was saturated with humidity in the first of these islands at 1000 feet above the level of the sea, and in the second at an elevation of 4080 feet. At Rio Janeiro the mean temperature is 73.4°, and much higher inland; the woods are so damp that it is difficult to dry plants; and in such situations multitudes of orchidaceous epiphytes spring up. But in the immediate vicinity of Buenos Ayres, where the mean temperature is 62° and the air dry, they are unknown; and in the high dry land of Mendoza, where the aridity is still greater, the whole order disappears, with the exception of a single species. On the west coast of South America, as high as Lower Peru, orchidaceous epiphytes are unknown, a circumstance which is not surprising when we consider the effect of the currents setting round Cape Horn, which bring the mean temperature of even Lower Peru itself down to 60° at night, and how arid the whole of that region is, with the exception of a few valleys. No country however exhibits in a more striking manner than India the necessity of a hot and damp climate for the production of orchidaceous epiphytes. In the Malayan Archipelago, the mean temperature of which is estimated at between 77° and 78°, and is very damp, they are found in profusion. In Nepaul it is upon the sides of the lower mountains that they occur, where they vegetate amongst clouds and constant showers; while on the continent of India they are almost unknown, their place being occupied by parasitical Loranthi. The traveller finds himself in the morning on the dry plains of Hindostan, where the mean temperature is 80°, and where all the trees are destitute of orchidaceae; and at noon he is at the foot of the first range of the Nepaulese hills, where every tree teems with that class of plants. There are however places on the continent of India where they are not less numerous than in Nepaul; at the entrance of the Ganges, the Brahmapootra, the Irrawaddi, and the rivers of Martaban, they exist in vast quantities; but all these stations are excessively damp. In the Botanic Garden of Calcutta they grow most vigorously during the rainy season, but in the fiercely hot season, which begins in March and lasts till the 10th of June, they perish, notwithstanding all the care they receive. Madagascar and the Isle of France offer similar evidence to the same effect.

While however these statements are applicable to a very large part of orchidaceous epiphytes, there are some striking exceptions that require to be pointed out, both with regard to atmospheric moisture, and to the temperature requisite for their production.

Mr. Allan Cunningham has shown in the 'Botanical Register,' fol. 1839, that in New Holland there are three of these plants which require a very dry atmosphere, and it is probable that others exist in other countries. 'These are Dend. speciosum, Br., an epiphyte uniformly found upon the rugged trunk of Eucalyptus resinifera, or Ironbark, in the open very dry forest grounds of the older colony at Port Jackson; Cymbidium canaliculatum, Br., which, of late years, has been observed beyond the Tropic, both at Moreton Bay and still farther to the southward at Hunter's River, growing upon the principal limbs of several of the eucalypti in the dry open shadeless forest. These two epiphytes flourish most luxuriantly in an extremely dry atmosphere, and flower usually in the summer season in their native wilds, the high temperature of which is oftentimes greatly increased by the blighting hot winds which not unfrequently prevail at that period from the northwest. The third is Dendrobium undulatum of Mr. Brown, a handsome species originally discovered by Sir Joseph Banks at Bustard Bay, and which has been lately found on barren hills, naturally clear of timber, upon the banks of the Brisbane River at Moreton Bay, where the plant forms tufts on bare rocks exposed to the full heat of the sun, which, during nine months of the year, is very considerable on that part of the coast.'

In many cases a much lower temperature than that hitherto spoken of is natural to these plants, and there are some instances where they are naturally accustomed to rigorous weather. In America, their favourite station, according to Humboldt, is in the gorges of the Andes of Mexico, New Grenada, Quito, and Peru, where the air is mild and humid, and the mean temperature 63°—66° Fahr. (17°—19° Cent.) In these localities they are so abundant, that, according to the Authors of the '*Flora Peruviana*,' above 1000 species might be found in Tarma, Huanuco, and Xauxa alone. It is therefore not surprising that one species, Epidendrum conopseum, should advance so far to the northward as the rice climate of Florida, where it grows on the bark of Magnolia glauca, nor that others should be found in the damp maritime parts of the government of Buenos Ayres. But it is more remarkable that an oncidium nubigenum should occur at the height of 14,000 feet on the mountains of Peru, and that other species should, upon the authority of M. Descourtilz, be able to bear without difficulty the cold glacial winds of the high serras of Brazil. The same peculiarities occur in the eastern world. Reinwardt speaks of great quantities of Orchidaceæ in the Storax and Laurel woods of Java, growing along with Nepenthes, Rhododendrons, Magnolias, and Oaks, in a zone of vegetation whose lower limit is 3000 feet above the sea. Dendrobium nobile, Renanthera coccinea, and some others, bear the periodical cold of Canton, where it occasionally freezes; Dendrobium catenatum and moniliforme occur in Japan as far north as 37° or 38°, or the parallel of Lisbon, and are periodically subject to a very low temperature; and Dr. Royle met with the deciduous Cœlogynes and Dendrobium alpestre on the Himalaya Mountains at the height of 7500 ft., where snow sometimes lies in winter for a week or more. To the southward they not only occur in the latitude of Port Jackson, where the mean temperature does not exceed 66° 6′, but even in much higher latitudes. The beautiful little Gunnia australis grows on the branches of shrubs in Emu bay, in Van Diemen's Land, in about 41° S., and Earina mucronata extends to 45° 45′ S., in 'the very permanently damp woods which clothe the shores of Dusky Bay in New Zealand,' where it was originally observed by Forster in Cook's second voyage, and where it has since been met with by Mr. Cunningham, whose words we quote.

Such are the more important data that we possess to guide us in the cultivation of orchidaceous epiphytes: the result of which is, that they are kept in this country in stoves the air of which is maintained in a state of constant moisture and at a temperature varying from 56° to 90° or more. The requisite uniformity of their atmosphere is provided for by keeping the houses but little ventilated and the glass of the roof well puttied at the junction of the squares. Shade is secured either by moveable laths or by a screen of netting or coarse canvass, or by some such contrivance; some even grow their plants in a house exposed only to the north: but it does not appear that this plan is a good one; for it is an object not only to exclude excessive light, but also to be able to admit it if requisite, and this cannot happen in a hothouse with a northern aspect.

The soil in which the plants are made to grow is peat or some other kind of decayed vegetable matter, thoroughly drained, and yet so compact as not to be liable to become dry by excessive loss of water. In many cases it is found advantageous to make the plants grow upon the apex of a truncated cone of earth rising several inches above the rim of the pot. Certain kinds are suspended in baskets, or in frames so contrived as to be filled with moss and decayed vegetable mould *rammed in very tight;* and provided that precaution is attended to, the caulescent drooping species, especially Dendrobiums and Vanda-like plants, thrive admirably; but in general it is found most advisable to plant in earth in common garden-pots. Attempts have been made to grow some species on decayed dead wood, but they are generally abandoned now; nor have the trials to cultivate them on the branches of living trees hitherto proved more successful. The orange tree was employed for this purpose by Mr. Lance with great success in Surinam; but in the hothouse it does not appear to suit them.

By attending to the natural habits of these plants, and observing the precautions just pointed out, the management of orchidaceous epiphytes has been brought quite within the skill of any good gardener. There are however two or three capital points about which cultivators entertain great difference of opinion.

The first is temperature. Some allow the thermometer to rise to 100° and higher in a summer's day, and never suffer it to fall below 65°; the consequence of which is, that their houses are so unpleasant that few persons can visit them to inspect the beautiful objects they contain. Others keep the temperature of even midsummer down to 80° at the most, and permit the minimum heat to be low in proportion: their houses are consequently cool and pleasant at all times. If we must admit that the first practice is eminently successful with some, so is the other most assuredly so with others, and we entertain no doubt that in the end it will be the only method followed.

The second question is the amount of moisture. Some form water tanks in their houses, the evaporation from the surface of which keeps the air continually at the point of saturation; others simply keep the air sensibly moist, by syringing or similar devices; the first is accompanied by a high, the latter by a moderate, temperature; in this case also we incline to believe that the latter practice is the best. The fact is that it may be reasonably doubted whether it is right always to follow nature literally in what we suppose to be her practice, and whether we ought not rather to adapt the management of our plants to the new and artificial conditions under which they are placed. Keeping plants in a state of constant excitement by exposure to an excessive climate is a certain means of weakening them in the long run, and may be compared to keeping an animal always awake. It may be very true that this may seem to happen in nature; but does it really happen? Is it not probable that the long diurnal darkness of a tropical situation may be intended as a compensation for the high excitement of daylight? and are not we, with 18 hours' daylight in summer, in an essentially different position from what orchidaceous epiphytes from equinoctial regions are exposed to in a wild state? Moreover, it can hardly be doubted that a moderate temperature is sufficient for them, even if they can be made to bear an excessive climate.

The third unsettled point is of another nature. In our hothouses we often maintain a high temperature all the year round, keeping our stove-plants growing from January to December. In nature this hardly ever happens. If a country has no winter, it has its dry season, during which plants become more or less torpid. This is quite the case in all the countries inhabited by orchidaceous epiphytes, with the exception of some of the temperate parts of Mexico, where the climate is equal and mild. Should we not therefore give such plants, when cultivated, a similar period of repose? About this the opinions of cultivators are so much divided that we cannot say on which side the majority of votes would go. Mr. Bateman calls attention to the fact in his account of Colley's mission to Guiana. 'In consequence,' he says, 'of the unexampled length of the dry season, scarcely an orchidaceous plant was seen in flower, or a pseudo bulb which had not lost its leaves. When, however, the rains had commenced, that is, in the month of July, the Orchidaceæ were pushing rapidly into flower, as were also some of those collected by Mr. Colley, which reached this country in as dry and shrivelled a state as Dutch bulbs usually come over in. This may afford a hint for their cultivation.'

And Henchman, in like manner, urges the circumstance upon the consideration of gardeners:—

'The atmospheric changes,' he says, 'are very great in tropical climates; and, as I consider that Orchidaceæ derive their main support directly from the atmosphere, I think too much attention cannot be paid to the various changes by which they are in their natural state liable to be affected. One of the principal objects kept in view by growers of Orchidaceæ appears to be the keeping up a regular heat in the stove. Nothing can be more contrary to nature; for in the tropics, to a sultry day, with the thermometer standing at from 85° to 95°, succeeds a cool night and a cold morning, the thermometer falling to 60° or [illegible], effecting in twenty-four hours a change of temperature of from 20° to 30°. During the dry season, periods of two, three, and often extending to five or six months, the whole nourishment derived by the Orchidaceæ must be communicated through the agency of the tree to which they are attached, or from the atmospheric moisture which is the effect of the action of the sun upon the dew which has fallen during the night and morning; for the situations generally occupied by Orchidaceæ preclude the possibility of the dew reaching them in its descent; and slight though the moisture be which is communicated through these channels to Orchidaceæ, it is nevertheless sufficient to retain the vital principle in the pseudo-bulb, though not sufficient to rouse it into action. The dry season then appears to act upon Orchidaceæ on much the same principle as our winter acts upon our trees, &c. It is for them a period of rest; and the pseudo-bulbs having been well ripened, are ready, when the wet season has given them a sufficient stimulus, to push forth luxuriantly both leaves and flowers.' Nevertheless some of our best gardeners object to the plan of periodical resting; and, it must be added, appear to succeed without attending to it.

So far as the opinion of the writer of this article is of any value, it is rather in favour of the system of resting these plants for three or four months annually, by lowering the temperature to 60°, or thereabouts, and diminishing the moisture very considerably; indeed in regard to Catasetums

Cyrtopodium, Pliaiis, Bletia, Gondersum and some others with deciduous leaves, there is no doubt that the plan is indispensable; and it would probably be equally advantageous with respect to all the kinds with fleshy stems or pseudo-bulbs; but how far it may suit caulescent species with the habit of Vanda and Aërides can only be ascertained by direct experiment.

EPI'RUS (ἤπειρος, mainland), a name given to that district in Northern Greece which extended from the Ceraunian mountains on the north to the Ambracian gulf on the south, and from the Ionian sea to the chain of Pindus, probably to distinguish it from the large, populous, and wealthy island of Corcyra which lay opposite to the coast. It appears that in very antient times Acarnania was also included in the term, and in that case the name was used in opposition to all the islands lying along the coast. (Strabo, p. 451; Homer, *Odyss.*, xiv. 100.) The antient geography of Epirus was attended with great difficulties even in the time of Strabo; the country had not then recovered from the effects of the destruction caused by Paulus Æmilius in 167 B.C., who destroyed seventy towns, and reduced to slavery 150,000 of the inhabitants (Polyb. ap. Strab., p. 322; Liv., xlv. c. 34; Plut. *Æmil.*, c. 29), after which the greater part of the country remained in a state of absolute desolation, and where there were any inhabitants they had nothing but villages and ruins to dwell in. (Strabo, p. 327.) The inhabitants of Epirus were scarcely considered Hellenic. The population in early times had been Pelasgic. (Strabo, p. 221.) The oracle at Dodona was always called Pelasgic [DODONA], and many names of places in Epirus were also borne by the Pelasgic cities of the opposite coast of Italy (Niebuhr's *Hist. of Rome*, i. p. 31); but irruptions of Illyrians had barbarised the whole nation; and though Herodotus (ii. 56) speaks of Thesprotia as a part of Hellas, he refers rather to its old condition, when it was a celebrated seat of the Pelasgians, rather than to its state at the time when he wrote his History. In their mode of cutting the hair, in their costume, and in their language, the Epirotes resembled the Macedonians, who were an Illyrian tribe. (Strabo, p. 327.) Theopompus (apud Strab., p. 323) divided the inhabitants of Epirus into fourteen different tribes, of which the most renowned were the Chaonians and Molossians, who successively maintained a preponderance in the district. The Molossians claimed a descent from Molossus, the son of Neoptolemus and Andromache. Neoptolemus is said to have migrated from Thessaly into Epirus after the Trojan war, and to have settled there in obedience to the injunctions of an oracle. We hear nothing of his descendants till the time of Themistocles, who was hospitably received by Admetus, king of the Molossians, while flying as a persecuted exile from the reach of his enemies. (Thucydides, i. 136.) The other kings of the Molossians are mentioned between this period and the time of Philip of Macedon, when this kingdom rose into importance by the matrimonial connexion of Alexander of Epirus with the king of Macedon. Philip married Alexander's sister, Olympias, and gave him his daughter Cleopatra in marriage. (Diod. Sic., p. 557.) Alexander was the first of the Molossian princes who bore the title of king of Epirus. (Strabo, p. 280.) He invaded Italy to assist the Tarentines against the Bruttii and Lucani, and was slain near Pandosia. (Liv., viii. 24.) After the death of Alexander, Æacides and Alcetas, the sons of his predecessor, Arybas, successively mounted the throne. Pyrrhus, the son of Æacides, is the best known of the sovereigns of Epirus. The family of Pyrrhus became extinct three generations after his death, and the government was turned into a republic, which subsisted till the year 167 B.C., when the Epirotes were suspected of favouring Perseus of Macedon, and utter destruction was, as we have already mentioned, inflicted upon them by the Roman general P. Æmilius. Of the other Epirotic nations, the Thesprotians were most celebrated. They are mentioned by Homer, who does not name the Chaonians and Molossians (*Odyss.*, xiv. 315), and are considered by Herodotus to have been the progenitors of the Thessalians. (vii. 176.) In their territory were the oracle at Dodona, the old city of Ephyra, and the rivers Acheron and Cocytus, celebrated in the old mythology. It is not possible to draw accurately boundary lines of the district occupied by these three tribes of the Epirotes; it is known that the Chaonians occupied the northern district, and the Molossians the southern, while the Thesprotian territory lay in the middle. The most celebrated cities in Molossia were Ambracia and Nicopolis. The former was a Corinthian colony, founded about 650 B.C. It had a harbour on the Gulf of Arta, and a small naval force. It contributed seven ships to the united fleet at Salamis (Herod. viii. 45), and twenty-six to their Corinthian expedition against Corcyra, just before the Peloponnesian war. (Thucyd. i. 46.) Ambracia sustained a very severe blow in the defeat upon the Amphilochians a short time after (Thucyd. iii. 68), but their losses were in some measure repaired by a new colony from Corinth. (Thucyd. iii. 105, &c.) Pyrrhus made Ambracia his usual place of residence. (Liv. xxxviii. 9.) It sustained a very remarkable siege during the war between the Romans and Ætolians. (Polyb. xxii. 13.) Under the Roman dominion it sunk gradually into insignificance, and its ruin was completed by the transfer of its inhabitants to Nicopolis, which was founded by Augustus to commemorate his victory at Actium. The ruins of this last city are very extensive. (Hughes's *Travels*, ii., p. 412.) The reader will find a minute description of the Gulf of Arta in the *Journal of the Royal Geog. Society*, vol. iii., p. 77.

The modern Albania corresponds in part to Epirus. As the domain of Ali Pacha, it has been a district of great interest in modern history, and Suli and Parga have become well-nigh classic names. [ALBANIA.]

Coin of Epirus.

British Museum. Actual size. Silver. Weight 161¼ grains.

EPISCOPACY. [BISHOP.]

EPISCO'PIUS, SIMON (whose real Dutch name was Bisschop), was one of the most learned men of the seventeenth century, and the chief supporter of the anti-calvinistic doctrines advocated by his contemporary Arminius. He was born in the year 1583, at Amsterdam, where he received his school education. In 1600 he went to the then newly-founded university of Leyden, of which he became a distinguished member, and entered with zeal and great ability into the predestinarian controversy between the Arminians and Gomarites, which at that time excited a deep and general interest. He was ordained in 1610, as the minister of the village of Bleyswyck, near Rotterdam, and in the following year he was deputed to the office of Arminian advocate at the conference held at the Hague between the Remonstrants and their opponents, the Calvinists. It is a proof of the influence and of the acknowledgment of his superior theological learning that he was chosen to fill the chair of professor of divinity in the university of Leyden, as the successor of the celebrated Professor Gomar, whose doctrinal theory he had powerfully opposed. The predestinarian controversy was carried on shortly after with such virulence and popular excitement that Episcopius was not only exposed in the streets and in the pulpit to the greatest abuse and insult, but, on one occasion, barely escaped from being stoned to death. The predominant party of Calvinists, or Gomarites, treated him with great injustice and tyranny at the synod of Dort, to which he went as a deputy from the states of Holland. He was refused a hearing in behalf of the less numerous party of Arminians. He was told that the synod had met not to discuss but to judge; and it having been decreed that he and the other professors who formed the body of the Arminian delegates should neither explain nor maintain any point without being asked to speak, Episcopius and his colleagues refused to submit. They were, in consequence, expelled from the synod, and were subsequently deposed from the functions of the ministry and banished from the territory. Episcopius retired to France, and continued to write in defence of Arminianism, and to console and encourage his unfortunate brethren. In 1626, when sectarian animosity had somewhat subsided, he returned to Holland, and became the minister of the church of Remonstrants at Rotterdam. Finally, he was made rector of the college founded by the Remonstrant party at Amsterdam, where he died, in 1643, at the age of 60. His works were published collectively in 2 vols. fol., entitled 'Opera Omnia Theologica,' &c., Curcellæi edita. Amsterdam, 1650, 1665, and 1671; and in London in 1678. They consist chiefly of the following treatises: 'Collegium Disputationum Theologicarum in Academia Leydensi,' Dortdrecti, 1688; 'Fur Prædestinatus,' Dort., 1642; 'Antidotum adversus Synodi Dortdracenæ Canones;' 'Confession of Faith;' 'Popish Labyrinth, or a Treatise on Infallibility,' &c., English translation, London, 1763. The latter works were written on the occasion of the author's being solicited by Peter Wadingus, a learned Jesuit, to become a Papist.

The highest eulogiums have been bestowed on the abilities of Episcopius by Le Clerc, Mabillon, Grotius, Bishop Bull, and many other eminent scholars of different sects. In England he was closely imitated by Dr. Hammond and Archbishop Tillotson. In his controversial writings he descends occasionally to abusive expressions; but in extenuation of this failing it should be considered that his opponents overwhelmed him with the insulting calumny of a stronger party. It was among the least of their accusations that he was a Socinian, a charge which is not without some degree of evidence to support it, for he strongly maintains that, throughout the first three centuries, the pre-existence of Christ was not an article of faith; and the refutation of this position of Episcopius occasioned Bishop Bull a great expenditure of learning. (*Life of Episcopius*, by Limborch, and by Curcellæus; *Life and Death of Arminius and Episcopius*, London, 1672, 12mo.; Moreri's *Dict.*; Chalmers's *Biog. Dict.*)

EPISODE (ἐπείσοδος, *epeisodos*). The Greek word *eisodos*, the principal member of this compound, when applied to the drama, means an entrance of the chorus on the stage; *epeisódion*, that part of a play which lies between two choral songs; and as these recitations had, in the rude beginning of the Greek drama, no connexion with the choral part, which they were introduced to relieve, the word, with its derivative Latin form, comes to signify a thing connected with, but not essential to, that of which it is part,—which may be taken out and leave a perfect work;—as, for instance, the Catalogue of Ships, in the Iliad, or the War in Heaven, in Paradise Lost. Episodes should grow naturally out of the subject; and when judiciously used, they relieve and diversify the main narration. But they should be sparingly introduced, so as not to create confusion. In the Orlando Furioso, for instance, or the Fairy Queen, the episodes are so many and so long, that the whole resembles a set of detached legends inartificially patched together, rather than a single poem pervaded by one intention. Episodes are commonly the most highly-finished portions, since their shortness warrants a degree of elaboration and ornament which could hardly be maintained through a long composition, and indeed might be wearisome if it could.

EPISPASTICS. [BLISTERS.]

EPISTYLE, the first layer of stone placed on columns to form the architrave. The term is derived from the Greek epistylium (ἐπιστύλιον), and that from the words *epi* (ἐπὶ) 'upon' and *stylus* (στῦλος), 'a column.'

EPITAPH (ἐπιτάφιον, *epitáphium*), an inscription on a tomb; from ἐπὶ, upon, and τάφος, a sepulchre. Inscriptions in honour of the dead are perhaps as old as tombs themselves; the most antient however with which we are now acquainted are probably those of Simonides upon Megistias the soothsayer of the little army of Leonidas, and on the heroes who fell at Thermopylæ, preserved by Herodotus. (vii. 228.) Another epitaph of very high antiquity may be referred to in the antient Greek inscription found in the Ceramicus at Athens, upon the warriors who fell at Potidæa 432 years B.C. The original, in a mutilated state, is among the Elgin marbles in the British Museum. (No. 348.) The reader will find examples of Greek and Roman epitaphs in the Elgin and Townley marbles of the British Museum, published under the superintendence of the Society for the Diffusion of Useful Knowledge.

The earliest epitaphs of this country were those of the Romans or Romanized Britons, which usually began with D. M. (*Diis Manibus*), followed by the name, office, and age of the deceased, and a conclusion which informed the reader by whom or through what means the inscription was erected. This seems to have been the ordinary formula of the sepulchral inscriptions of that period.

Whether the Saxons or the Danes used monumental inscriptions among us, either in their own or in the Latin tongue, has been doubted The few which we have for people of the Saxon times are the compositions of a later date. Three or four small slabs, however, bearing crosses and some female names, supposed to be those of nuns, were dug up a few years ago at Hartlepool.

The regular series of English epitaphs begins in the 11th century, when they were still written in the Latin language. One of the most remarkable of this period is that preserved in Sir William Dugdale's Baronage, for William de Warren, earl of Surrey, who died in 1088, copied from the abbey register of St. Pancras Lewes, of which he was the founder, where it is said to have been engraven on white marble.

Hic Gulielme Comes locus est laudis tibi fomes
Hujus fundator, & largus sedis amator.
Iste tuum funus decorat, placuit quia munus
Pauperibus Christi, quod prompta mente dedisti.
Ille tuos cineres servat Pancratius hæres,
Sanctorum castris qui te sociabit in astris.
Optime Pancratie, fer opem te glorificanti;
Daque poli sedem, talem tibi qui dedit sedem.

A mutilated epitaph for Gundreda, daughter of William the Conqueror, and wife of this earl of Surrey, is still remaining in the church of Southover in Kent; she died in child-bed in 1085. The generality, however, of the epitaphs of this period are neither so long nor so laboured as the earl of Surrey's. Vitalis, the twenty-first abbot of Westminster, who died in 1082, had only these lines—

A vita nomen qui traxit, morte vocante,
Abbas Vitalis transiit, hicque jacet.

In the 12th century our epitaphs are few. The tomb usually consisted of a single figure; and the inscription added to it was little more than a mere designation of the person: such as that at Hereford, of the year 1148,

Dominus Robertus de Retum episcopus Herefordensis;

or that in the chapter-house at Gloucester, 1176,

Hic jacet Ricardus Strongbow, filius Gilberti Comitis de Pembroke.

Early in the 13th century we begin to find the epitaph in French, occasionally accompanied by promises of absolution to such of those who passed the tomb as might pray for the soul of the deceased. Weaver gives an instance of this in his 'Funeral Monuments,' in an inscription for Robert the third earl of Oxford, who died in 1221 ·

Sire Robert de Veer le premier Count de
Oxenford le tierz git icy. Dieu de l'ame si lui
Plest face merci. Ki pur l'alme priera xl.
Jors de pardon avera. + Pater noster, &c.

At the church of Kingswear in Devonshire we have an epitaph of this kind in rhyme—

Vos qui ici venes
Par l'alme Philip pries.
Trente jours de pardon
Serra vostre gwerdon.

Henry the Third's epitaph, in the same language, with a prayer for mercy to him, still remains embossed in old capitals round the ledge of his tomb in Westminster Abbey, A. D. 1272.

The epitaph in French continued till the middle of the 14th century; after which time inscriptions in the vernacular tongue become common. One of the earliest, perhaps, was that upon a stone over one of the Savile family at Thornhill in Yorkshire,—

Bonys emongq stongs lys ful
steyl, gwylste the sawle wan-
deris were that God wylethe.

Blomfield, in his 'History of Norfolk,' has preserved a curious specimen of the English of the time, in an epitaph from Holm Church in that county, about A. D. 1404:—

Henry Notingham and his wyff lyn here
That mayden this church, stepull, and quere,
Two vestments and belles they made also,
Christ them save therefore fro wo!
And to bringe ther soules to bles of heven
Saith Pater and Ave with mylde steven.

Gough, in his 'Sepulchral Monuments,' whence much of our information has been obtained, gives the following from the church of St. Peter at St. Albans, 1420:—

In the yere of Christ on thousand and four hundryd ,ful trew with four and
 sixteene
I Richard Skipwith gentylman in birth late fellow of New Inne,
In my age twenti on my sowl partyd from the body in August the 16th day
And now I ly her abyding God's mercy under this ston in clay,
Desyring yow that this sal see unto the Meyden pray for mee
 That bare both God and Man.
Like as ye wold that other for ye shold
 When ye ne may nor can.

The clergy and religious, however, still preferred Latin, perhaps, as their more familiar idiom; and one or two in clauses occur, even as late as the middle of the 15th century, where the epitaph is given in Latin rhyme. The last edition of Hutchins's Dorsetshire mentions the following as engraved round the arch of the church door at Durweston near Blandford, A.D. 1435:—

[illegible]
[illegible]

The generality of the Latin epitaphs of this period were on plates of brass, and began most frequently with *orate pro animâ*, perhaps followed by *miserrimi peccatoris*; an address, says Dr. Johnson, in the last degree striking and solemn, as it flowed naturally from the religion then believed, and awakened in the reader sentiments of benevolence for the deceased, and of concern for his own happiness. There was nothing trifling or ludicrous, nothing that did not tend to the propagation of piety and the increase of devotion.

With the reformation of religion even this ceased. The reign of Elizabeth affords but few instances to the contrary; though it is singular that two occur beginning 'pray for the soul,' upon monuments at Stanton Harcourt in Oxfordshire, one dated 1586, the other 1589.

After this period the diffusion of learning gave a classic turn even to the epitaph, and though the reigns of Elizabeth and James I. can furnish but few of a pure standard, there is one of Ben Jonson's on the Countess of Pembroke which scarcely yields to any in the Anthologia.

Underneath this sable hearse
Lies the subject of all verse;
Sidney's sister, Pembroke's mother.
Death, ere thou hast slain another,
Good, and fair, and wise as she,
Time shall throw a dart at thee.

The epitaph on Sir Christopher Wren need hardly be repeated; though it is said to have been borrowed. In real merit it is probably surpassed by the latter part of that in King's College Chapel, Cambridge, over the resting-place of Thomas Crouch,—

Aperiet Deus tumulos, et educet
Nos de sepulchris.
Qualis eram, dies isthaec cum
Venerit, scies.

Wit and humour have also marked the composition of the epitaph in almost all ages. Innumerable instances will be found in all the printed collections. Margaret of Austria composed for herself the following couplet, when in imminent danger of shipwreck:—

Cy gist Margot, noble damoiselle,
Deux fois mariée, et morte pucelle.

Collections of epitaphs, antient and modern, are numerous; there are many of great merit in the Greek Anthologia. A very large collection of epitaphs will be found in 'Theatrum Funebre, exhibens per varias scenas Epitaphia nova, antiqua, seria, jocosa, &c., in quatuor partes distinctum, extructum a Dodone Richea (seu Ottone Aicher),' 4to. Salisburgi, 1675; Hackett's 'Select and Remarkable Epitaphs on Illustrious and other Persons,' 2 vols. 8vo., 1757, probably preserves the best English collection.

The funeral orations of the Greeks were called by the name of *Lógos Epitáphios* (Λόγος Ἐπιτάφιος), or a discourse over the tomb made at the time of interment. It is only necessary to mention this to prevent any confusion of this kind of epitaph with that which is the subject of the present article.

EPITHALA'MIUM (ἐπιθαλάμιον, from ἐπί, 'at' or 'near,' and θάλαμος, 'chamber,' especially that of a new-married couple), a poem composed in honour of a marriage. It was sung by youths and maidens conjointly, at the door of the bridal chamber, after the bride and bridegroom had entered, and also before they rose in the morning. The first Greek epithalamium known to have been written was a poem by Hesiod, now lost, on the marriage of Thetis and Peleus. The most remarkable extant are those of Catullus, who has left three beautiful specimens of this sort of composition. The first, on the marriage of Julia and Torquatus, is the most curious and interesting as an illustration of manners. That on the marriage of Peleus and Thetis, which is probably only a fragment, is one of the most beautiful extant specimens of Latin poetry. Among the Hebrews, as well as the Greeks and Romans, this species of rejoicing was in use. The subject is hardly in accordance with modern manners. Spenser has treated it beautifully and delicately in his Prothalamium and Epithalamium on the marriage of the Ladies Somerset. Many other English specimens may be found, especially among the writers of the seventeenth century; but we know of none remarkable enough to require notice.

EPOCH. (Astronomy.) This term is frequently applied to signify, not a moment of time, but the longitude which a planet has at that moment of time. In order to predict the longitude of a planet at any epoch, some preceding epoch must be taken, at which the longitude is known. This latter is called, *par excellence*, the epoch; and the term longitude at the epoch has been abbreviated into epoch.

EPOCH. (Chronology.) [ÆRA.]

EPODE (in Greek ἐπῳδός, *after-song*, from ἐπί, 'on' or 'upon,' and ᾠδή, 'song') is one of the three divisions of the Greek ode. [CHORUS.] The performers in singing it stood still; it was not, like the strophe and antistrophe, commensurate with another member of the ode; so that the poet was unfettered as to its length and as to the choice of measures. The epode, however, is not essential to an ode; many of the Greek choruses have none. Most of Pindar's odes, on the contrary, have an epode interposed between each antistrophe and the following strophe. Epode, according to the grammarians, is also a metrical term given to those measures in which a short *verse* follows a long one, of which the former is called *proodic*, the latter *epodic*. Hence the fifth book of Horace's Odes is called the Book of Epodes, because nearly all of them are written in that sort of measure: as, for instance,—

'Ibis Liburnis inter alta navium,
Amice, propugnacula!'

EPPING. [ESSEX.]

EPSOM. [SURREY.]

EPSOM SALT. [MAGNESIUM.]

EQUAL. Two magnitudes are equal when one of them may be made to coincide with the other. This is the geometrical definition of Euclid, and is placed by him among the axioms, though in reality it is nothing more than the definition of the word equal. Nor is it quite sufficient: a triangle for instance and a parallelogram may be equal in area, and yet neither can, without alteration of form, be made to occupy the same space as the other. The truth is, that the idea of equality is one which will admit no definition: and moreover, it is to the more general notion of the existence of ratio (of which equality is one particular case) that all metaphysical discussion upon this term should be referred.

Some geometers have proposed to use the word equivalent as applied to solids of equal area but different forms; and the distinction is at least harmless. We cannot say more; for when it is once established that the term used by Euclid is to be understood in a wider sense than the words of the axiom will bear, no liability to confusion remains.

EQUATION (in pure mathematics), an assertion of the equality of two magnitudes, represented to the eye by the symbol =. Thus A = B is to be understood as a proposition, declaration, or assertion that the magnitude A is equal to the magnitude B. It is not immaterial to insist upon this definition; for beginners frequently confound the notion of an equation (an *assertion* of equality) with the idea of equality itself, and speak of two *equations* being *equal*.

To treat of equations is to write on mathematics in general; for when two magnitudes A and B are of the same kind, A must be either greater than, equal to, or less than B. The objects of mathematics generally require that it should be determined (supposing A and B not equal) by how much one exceeds the other: and the assertion that A exceeds B, and exceeds it by M, is equivalent to the *equation* A = B + M. The assertion of inequality is called by continental writers an *inequation*; and one work (we are not aware of any other) has been written on the subject; Canard's 'Traité des Inéquations,' &c.

An equation may be one of two kinds: necessarily true, whatever may be the value of the symbols employed, and called *identical*; or true only upon the supposition of some particular value being given to certain magnitudes, or of some particular relations existing. The latter species are called equations of *condition*. Thus—

$$a=a, \quad a+a=2a, \quad (a+b)^2=a^2+2ab+b^2$$

are identical equations; while

$$2a+1=13, \quad x^2=5x-4$$

are equations of condition; the first requiring that a should be 6, and the second that x should be either 4 or 1. Again, $a+b=1$ is an equation of condition.

Certain equations being supposed to be true, the determination of all their consequences, that is, of all equations which follow from them, is the great object of mathematical analysis. The difficulties which lie in the way are of various classes, and give rise to various modes of considering equations. These are so widely separated from each other, and diverge into such different subjects, that we can here do no more than point out two or three of the most remarkable species of inquiries. This we shall do in short articles headed by the word Equation.

EQUATION. (Astronomy.) The characteristic of all the heavenly motions is, that they nearly follow a simple law, but not quite. The small corrections which must be added to or subtracted from the results of the simple law, in order to secure accurate prediction, are called equations. Thus, the moon moves round the earth with a motion which is not very far from uniform; the average motion is therefore ascertained, and, starting from a given epoch, at which the true place is known, the longitude for that epoch is first increased by the longitude which would have been described by the moon, had she moved with her average motion. The result must then be altered by a number of different *equations*, some being consequences of the elliptic figure of the moon's orbit, some of the sun's attraction, &c. When all these equations have been annexed, the result is the moon's longitude for the time proposed.

EQUATION OF THE CENTRE. [Sun, Moon, &c.]

EQUATION OF THE EQUINOXES. [Precession.]

EQUATION OF TIME. [Sun.]

EQUATION, ANNUAL. [Moon.]

EQUATION OF PAYMENTS, an arithmetical rule, for the purpose of ascertaining at what time it is equitable that a person should make payment of a whole debt which is due in different parts payable at different times. This rule is now of no practical use, as it rarely, if ever, happens that it is considered necessary to *equate* payments. Sums of money due at future periods are generally secured by bills of exchange or by promissory notes, and when the date of payment is altered, it is usually immediate payment which is contemplated. [Interest.]

EQUATIONS, COMMON ALGEBRAICAL. In these the question is to find what number or expression must be substituted for a letter, in order that an equation may be true. Example, what must be the value of x, in order that

$$x^2=(a+b)\,x-ab$$

the answer is x is either $=a$ or $=b$: meaning that, *if the equation be true*, x must be one of the two, a or b. These results are called values of x, roots of the expression $x^2-(a+b)\,x+ab$, or solutions of the equation.

We ought in this place to give some account of the history of inquiries, which at one time composed the whole of algebra, and are still considered of fundamental importance. But here, as in some other cases, we are induced to defer the consideration of the subject to as late a period as we can, on account of the rapid progress which is being made on points which have presented difficulty for centuries. The mere mention of the very recent researches of M. Sturm in France, of Mr. Jerrard in England, &c., will be, to those who understand the subject, a sufficient excuse for our referring to Theory of Equations; this being, moreover, the most common title of the subject in question.

EQUATIONS, DIFFERENTIAL, and EQUATIONS of DIFFERENCES. The difficulty in this case is the inversion of the processes of the Differential Calculus and the Calculus of Differences. We give an example of each case:—

$\dfrac{d^2y}{dx^2}-\dfrac{dy}{dx}=x$; is a differential equation. The question asked is, what is y, that function of x, of which it is the property that the first differential co-efficient subtracted from the second will always leave x.

$\Delta y=y+1$, is an equation of differences. The question asked is, what must y (understood to be a function of x) be, in order that an increase of a unit in the value of x shall increase y by $y+1$. This is in reality a simple functional equation, as follows. Required ϕx, so that

$$\phi(x+1)-\phi(x)=\phi x+1.$$

The two classes of equations, thus briefly noticed, include in their history that of most of the mathematico-physical sciences. The progress of the theory of gravitation since Newton is contained in successive attempts to solve certain differential equations. All questions of dynamics, electricity, the theory of light and heat, &c. &c., resolve themselves at last into the solution of differential equations. Works on the differential calculus contain but little on this subject, its utility considered: and it is to the applications themselves that the student must look for further information.

EQUATIONS, FUNCTIONAL. In this case the question is to find the form of a function which will satisfy certain conditions. For instance $\phi(x^2)=\phi x+1$. Here the question asked is, what is that algebraical expression which will be increased by 1, *whatever may be the value of x*, by changing x into x^2. [Functions, Calculus of.]

EQUATOR and ECLIPTIC, the two principal circles of the sphere. The first is that circle of the apparent celestial sphere which is in all points equally distant from both poles; the second, the circle through which the sun appears to move. The equator is so called from being the circle on the arrival of the sun at which the day and night become equal. The ecliptic derives its name from being the circle on which (or near which) the moon must be in the case of an eclipse. [Sphere, Doctrine of the.]

EQUATORIAL INSTRUMENT. This name is generally given to astronomical instruments having their principal axis of rotation in the direction of the poles of the heavens. When the purpose of a machine of this nature is simply to carry a telescope, it has been called a *machine parallactique* or *parallatique* by the French, and sometimes *polar axis* by English writers; but we shall include both in this article.

The complicated system of circles which formed the astrolabe of Hipparchus, described by Ptolemy (Almagest, lib. v., cap. i.), was made moveable on two pins, which marked the places of the pole in a metallic meridian circle, and thus may be called in some sort an equatorial. There is an excellent plate of the astrolabe in the title-page of Halma's translation, tom. i. This instrument and the copies which were made of it afterwards, according to Ptolemy's description, by the Arabs and by Walther of Nuremberg, were designed for observing the longitude and latitude of a heavenly body directly. The torquetum of Regiomontanus was for the same purpose, using surfaces instead of axes to determine motions, but we know *not* whether it ever was actually made. Tycho seems first to have seen the immense superiority of the simpler instrument, which sufficed for determining right ascension and declination; and the genuine equatorial is therefore due to him. In his 'Astronomicæ Instauratæ Mechanica,' Noribergæ, 1602, we find the figures and descriptions of three 'equatorial armillæ' of different sizes and constructions: in one, the diameter of the meridian circle was 7 cubits, or 10½ ft. (For Tycho's equatorials see Astrolabe.) In the 'Rosa Ursina' of Scheiner, Bracciani, 1626-30, p. 350 et seq., there is a plate and description of an equatorial mounting invented by Gruenberger, to be used with a lens or telescope, for forming an image of the sun—the mode of observation then in vogue,—or, with a telescope, in the modern manner for viewing the moon, stars, and other phenomena. Gruenberger's equatorial is almost identical with that described and figured by Cassini as his *machine parallactique*, 'Mémoires de l'Académie,' 1721, p. 18, and which is also drawn and described under the same name by Bailly, 'Histoire de l'Astronomie Moderne,' vol. i., p. 601, plate [illegible], fig. 38; and by Lalande, 'Astronomie,' 1792, § 2400, et seq., plate xxiv. In 1674 Hooke published his 'Animadversions' on the first part of the Machina Cœlestis of Hevelius. In this remarkable tract he describes, p. [illegible] et seq., tab. 2, fig. 15, the polar axis, on which he proposes to fix his quadrant for measuring intermutual distances, and 'the watch-work, which is to make it move round in the same time with the diurnal revolution of the earth*.' The regulator of the watch-work is a ball and string, describing a conical surface. When so near an approach had been made to this great desideratum in telescope-mounting, it is somewhat remarkable that nearly 150 years should elapse before it was realized. The astronomical sector with which Flamsteed observed at Greenwich from 1676 to 1689 bears so strong a resemblance to the quadrant and stand described in Hooke's tract, that we are inclined to attribute the merit of its contrivance to Hooke, particularly as he recommends the artificer Tompion as 'having been imployed by him to make that which he had.' Flamsteed's instrument was a sextant mounted upon a polar axis; and a description of the instrument, with a plate, will be found in the 'Historia Cœlestis,' vol. iii. p. 103.

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* Hooke asserts that a clock with a circular pendulum was invented by him in 1665, and complains that Huyghens had published a description of his (in 1674) 'without naming him at all as concerned therein.' Huyghens says that he invented the clock with a circular pendulum about the same time that he applied the oscillating pendulum, i. e., sixteen years before the date of his book, and that several clocks of this description had been made, 'non sine successu,' in the mean time. Both Hooke and Huyghens promise a complete description of this clock at another opportunity.

The next step in constructing the equatorial was made by Roemer, to whom we owe the transit and circle, and whose merits as an astronomical mechanic surpass even his great countryman Tycho. According to Horrebow, *Basis Astronomiæ*, p. 39, tab. 1, the equatorial of Roemer was erected about 1690. Here we have the second essential to the instrument, a telescope mounted on a cross axis, which is placed at right angles to the polar axis; (this is sometimes called the declination axis, from carrying the declination circle, or transit axis from its analogy to the transit.) In this construction the telescope can be pointed in every direction, and we have heard Roemer's general idea recommended by a very competent judge as that which he would now follow in mounting a 20-foot telescope. Graham's differential sector and Sisson's equatorial are described in Vince's 'Practical Astronomy,' § 136 and 140, with figures. In both these instruments there is a long polar axis, supported at its upper and lower extremities; the telescope, with its circle or sector, is placed on one side and towards the middle of the axis.

A portable equatorial stand for carrying a reflecting telescope was invented by Short, and is described and figured in the 'Phil. Trans.' for 1749. This must have been a very ricketty affair, judging from the plate. In 1771 Nairne gave a description and figure of a much better instrument in the same work; and in 1772 or 1773 P. and J. Dollond published an account of a 'universal equatorial instrument, or portable observatory,' which in firmness and contrivance is very similar to that of Nairne. This construction, with some slight variations, was followed by Ramsden, in a portable equatorial made for Sir George Shuckburgh in 1779. All these portable equatorials labour under this serious defect; the telescope cannot be pointed on the same star in reversed positions, nor upon any star within 30° or 40° of the pole. Lalande, in his *Astronomie*, § 2413, pl. xxvi., gives an account of an equatorial made by Megnié, for the President de Saron, in which this difficulty is overcome by fixing the telescope at the extremity of the cross axis so as to overhang the hour circle. A very beautiful universal equatorial, in which the same position of the telescope is adopted, was constructed by Troughton, a plate and description of which will be given at the latter end of this article. There are some equatorials by Nairne and Adams which have a telescope at one end of the cross axis, but we are not aware of any plate or description.

A new era in the equatorial commences with the construction by Ramsden for Sir George Shuckburgh in 1791, which is very elaborately described with plates in the *Phil. Trans.*, 1793. In this instrument the telescope and declination circle form a complete and symmetrical transit circle, which is supported at its extremities by two assemblages each of three long parallel brass tubes forming the polar axis. The upper ends of these tubes are set into a circular open frame, from the centre of which the top pivot rises, and their lower ends rest on the base of an inverted cone which has the bottom pivot at its vertex. The polar axis is so long as to allow the telescope to revolve completely, and the object-glass is large enough to give a sight of the pole through the upper circle. The general form of this instrument is followed with some variations in almost every considerable English instrument which has been since made with the view of being used to measure with the circles. All have had a long polar axis supported at the extremities, and divided in the direction of its length into two limbs or cheeks, within which the declination axis is supported as a transit between its piers. Of this kind are the equatorials of Cambridge and Brussels, of Armagh, described in Rees's *Cyclopædia*, and of Camden Hill, described by Troughton, and figured in the *Phil. Trans.* for 1825, in the Preface to Herschel and South's Observations of Double Stars.

After Fraunhofer had succeeded in forming larger and better achromatic object-glasses than had hitherto been thought possible, he chose for a stand one which is in principle identical with the Machine Parallatique, only having the telescope hung on one side exactly as in the portable equatorial of Megnié. To these he applied a very ingenious clock movement, which greatly facilitated the optical use of the instrument, and rendered it a better micrometrical measurer than had existed. To prevent the telescope from bending, Fraunhofer applied a system of balance weights, which were, we believe, invented or brought into extensive use by Reichenbach. It would probably have been better if he had made the telescope stiff, by bracing a form, and had omitted the balance weights for the telescope altogether. It is evident, from their construction, that the least jar or roughness in handling the telescope must set the weights in motion, and consequently ruin the action of the object-glass until they come to rest; and it is not worth while to purchase a little useless accuracy in the measurement with the circles at such a cost. There is a considerable inconvenience in this construction: that in many positions a star cannot be followed from one side of the meridian to the other without bringing the telescope over; that is, turning the polar axis and the telescope each of them half round. This is particularly disagreeable in the measurement of double stars, which ought, if possible, to be observed near the meridian. There is, perhaps, a little more inconvenience in giving small motions to the telescope; but neither this nor the impossibility of using reversed observations in a majority of instances is of much consequence. On the other hand, when the workmanship and material and engineering are good, an instrument of this form may be expected to stand better in adjustment, and to admit of larger dimensions, and to require less room, than any other.

The most celebrated of Fraunhofer's equatorials is one which is erected at Dorpat, and has been described by Professor Struve. (*Beschreibung des grossen Refractors von Fraunhofer*, Dorpat, 1825, folio, with plates.)

Some enormous telescopes have been mounted on this principle: one carrying the largest achromatic telescope we believe in existence, of 14 inches aperture and 25 feet focal length, was erected at Markree Castle, county of Sligo, for E. J. Cooper, Esq., by Mr. Grubb, of Dublin. The tube of the telescope was constructed under the direction of Mr. Cubitt, and is a capital step in the art of applying large telescopes. The form is that of a very long barrel. T bars of wrought iron extend longitudinally from the object to the eye end, the edge bars being directed towards the centre, and these, after they are connected crosswise by strong rings, are covered with iron plate, which is [illegible] inch thick in the centre and $\frac{1}{16}$ inch at the extremities. The stiffness of this tube is more perfect than would be readily believed without actual examination, and we see no reason to doubt that a telescope, of at least twice these dimensions, may be mounted with success, so far as the tube is concerned, whenever such an object-glass can be procured. In all the other large equatorials which we have seen, the telescope is the weakest part; and as it is the habit of many observers to move their instruments by laying hold of the eye end, it is desirable, for this and for some better reasons, to have it as stiff as possible. In an equatorial to carry a 20-foot telescope now constructing for the observatory of Cambridge, at the expense of his grace the duke of Northumberland, and of Ramsden's form, though with many peculiarities and improvements, Mr. Airy has employed a square wooden tube, which promises to do very well. Mr. Dollond has recently made several equatorials on Sisson's construction, which answer very well. The polar axis in these is square, and composed of four strong slabs of wood, making a sort of tube, a little tapered towards the extremities. This is found to be abundantly stiff and firm, at least up to the dimensions which have been tried, viz., for telescopes of from 10 to 12 ft. focal length.

Though the problem of mounting a large telescope equatorially is not yet fully solved, yet great progress has been made in the last half-dozen years, and we may mention, as the results of recent experience, that it is not expedient to rest the pivots on small superficial bearings, or to relieve the weight by friction rollers, unless the axis of the rollers be made large. It appeared, in Mr. Cooper's equatorial and elsewhere, that when a heavy pressure was laid on a small bearing, the surfaces did not slip freely, but clung as it were, causing small oscillations about the position of rest. Again, great care should be taken in following Sisson's construction, or that which we have described as Ramsden's, to provide against any twisting in the axis; simple flexure is of little importance. In Sisson's construction, the junction of the telescope and its cross axis should be very firm; in Ramsden's, the union of the two sides of the polar axis with the base should be such as to prevent all wriggling; and in both, the telescope ought to be very stiff, if it is likely to be roughly handled. To Ramsden's we should apply steadying rods. It is also better to rest the pivots of the declination axis in Ys than in collars; but if a collar is preferred, it should be formed of an upper and lower half, which can be adjusted to clasp the pivot close when the collar wears loose. After all possible precautions, accuracy is not to be expected from a large equatorial, when used as an instrument measuring with its circles, compared with those of moderate size. The equatorial by Troughton, at Armagh, which is perhaps the finest instrument existing as a measuring circle, carries a telescope of only 42 inches focal length and 2¾ aperture, with an hour circle of 5 feet, and yet the telescope is more powerful than the circles used. Large equatorials are required whenever optical power is wanted, as in the examination of nebulæ, noting occultations, &c., where the micrometer is alone required for measurements, as in observations of double stars, or determinations of the diameters and forms and constitutions of planets, and investigation of the systems of those which have rings, satellites, &c.

The adjustments of an equatorial instrument are easy enough to a person tolerably familiar with the management of other astronomical instruments; and the corrections which are to be applied to observations made with an unadjusted equatorial, ought not to present any difficulty to an astronomer acquainted with spherical trigonometry, and with the ordinary rules for determining the value of the coefficients. Still, as there are many persons possessing equatorially-mounted telescopes, who have not the knowledge or even the leisure to understand this subject thoroughly, we shall proceed to give directions which will enable any one to adjust his instruments with more than sufficient accuracy and without trouble.

We suppose the latitude of the place and the direction of the meridian to be approximately known; and we shall always speak as if the instrument showed north polar distance, and the hour circle, when the sun is observed, read as an ordinary clock. Let the polar axis be placed nearly in the direction of the poles of the heavens. The adjustments proceed in the following order:—1st. The polar axis is placed at the altitude of the pole. 2nd. The indices of the declination circle are made to read 0, when the telescope points to the pole; this is sometimes called correcting the collimation in declination or north polar distance. 3rd. The pole of the instrument is brought into the meridian, and as it has already been set at the proper altitude, it now coincides with the pole of the heavens. 4th. The line of sight of the telescope is made perpendicular to the declination axis; this is similar to the collimation adjustment in the transit. 5th. The declination axis is placed exactly at right angles with the polar axis, if the means of adjustment are allowed. 6th. The hour-circle is made to read 0^h, when the telescope is in the meridian of the place.

1st. Observe any known star in north polar distance, and then turning the polar axis half round, observe the same star again; these observations should be as near the meridian as possible; and if the instrument is much out of adjustment, the star should not be very near the pole. Take the mean of the two observations, which is the distance of the star from the pole of the instrument, correct it for refraction, and then compare the result with the true north polar distance given by the Nautical Almanac, or computed from a standard catalogue. If the star be above the pole, and the instrumental north polar distance be *greater* than the true north polar distance, it is clear that the instrumental pole is farther from the star than is the pole of the heavens, or that it is too *low;* but if the instrumental north polar distance be *less* than the true north polar distance, then the pole of the instrument is too *high.* Correct this error by the proper screws for raising or depressing the polar axis, which may be done at once if the thread of the screw and the length of the polar axis be known.

2nd. Take half the difference of the above two observations; this is the index error of the declination verniers or microscopes, and they must be moved just so much in the proper direction by their adjusting screws, and set, if there be more than one, at their proper distances. The polar distance read off will now correspond with the true *instrumental* polar distance in every position of the instrument. Several pairs of observations should be taken, in order to ascertain these two errors with great accuracy before they are finally corrected and considered to be settled.

3rd. Turn the instrument six hours from the meridian either way, and observe the north polar distance of a known star not very near the pole nor yet near the horizon. Correct this for refraction. We will suppose the star observed to the east of the meridian, and that the observed distance exceeds that given by the Nautical Almanac or the standard catalogue; then the pole of the instrument is further from the star than is the pole of the heavens, or is to the west of its proper place; hence the upper pivot must be shifted to the east, or the lower pivot to the west, the proper quantity. In this, as in the former case, several stars should be used for greater accuracy; but there is no necessity for reversed observations, as the index error is already supposed to be corrected, or at least to be known, and therefore easily allowed for. The polar axis is now adjusted both in altitude and azimuth.

4th. Observe the transit of an equatorial star over the middle vertical wire or mean of the wires, note the time, and read off the verniers of the hour-circle. Turn the polar axis half round, and observe the same star a second time exactly as before. Now if the time between the two observations corresponds exactly to the difference between the two readings of the hour circle, all is right; if not, it is evident that one of the transits has been observed too early, and the other too late, on account of the erroneous position of the wires. If the time elapsed be *greater*, by 6^s suppose, than the difference of the hour angles, the first transit has taken place 3^s too early, and the second 3^s too late. Set again upon the star and observe how far it appears to travel in 3^s; and then, if the instrument is in the first position, move the wires that quantity in R.A. with the star, and *versâ vice* if the instrument be in the second position. The rule *mutatis mutandis* will apply to any case, and where there are no means of measurement and no mark, the adjustment must be made by repeated trials. With a micrometer in R.A., or with a mark, it may be performed with accuracy at once.

5th. This adjustment may be performed in two ways, either astronomically, or, when there is a level attached to the declination axis, mechanically. In the first case observe the transit of a star, not less than 45° from the equator, in reversed positions of the polar axis, exactly as in determining the collimation. Since an elevation of the west end of the declination axis causes the line of sight to describe a circle to the east of the pole, all the transits observed in that position will be too early, and *versâ vice* all will be too late when the east end is high. Again, if the west end is too high before reversing, the east is too high after reversing; so that an error of inclination has a different effect upon observations in reversed positions, and thus the interval is increased or diminished by twice the error of a single observation. The law of the error is that it varies as the tangent of the star's declination. Suppose the star observed to have 45° declination, and that the interval between the observations is, according to the clock, $3^m\ 8^s$, and according to the hour circle only 3^m. It is evident that the first observation was 4^s too early and the second 4^s too late, and since the tangent of declination = 1, the west end of the declination axis was elevated 1′ in the first position and depressed 1′ in the second. If the star had had any other declination, as δ, the 4^s should have been divided by the tangent δ before it was converted into arc. There is a second astronomical method which may perhaps suit some observers better, though less satisfactory, as it depends entirely on the accuracy of the position of the polar axis in azimuth. Having clamped the hour circle very firmly when the instrument is nearly in the meridian, observe the transits of some stars near the equinoctial and others distant from it. If the distant stars agree in giving the same clock error with the stars near the equinoctial, the declination axis is rightly placed in respect of inclination; but if not, then, taking the clock errors from the equatorial stars, it will readily be seen whether the stars between the pole and equator pass too early or too late. If they pass too early, the west end is high, if too late, the east end is high, and the inclination of the axis in arc is equal to $15'' \times \dfrac{\textit{error in time}}{\textit{tan. } \delta}$. In both these astronomical modes no error of collimation is supposed to exist.

The mechanical adjustment varies a little according as the level is applied. [Level.] This may rest with its Y's upon the pivots of the declination axis, as in the altitude and azimuth circle [Circle] and transit [Transit], or hang from two cylinders which, being fixed on the declination axis and parallel to it, project so far as to allow a level suspended from them to swing clear of the axis in all positions of the telescope. Place the declination axis horizontal by the level, and read the hour-circle; turn the polar axis half round, and place the declination axis horizontal again, and again read the hour-circle. If the readings are the same (or where the graduation is to 24h, differ exactly 12h) in both positions, the declination axis is adjusted; but if not, place the hour-circle half way between the position it actually has and that which it ought to have, and make the declination axis horizontal by raising or depressing the screws which adjust it. The swing level requires a preliminary adjustment, that of making the cylinders from which it hangs parallel to the declination axis, which is to be performed thus:—By turning round the telescope, bring the level directly below the declination axis; and by turning round the polar axis, bring the bubble into the middle, and clamp the hour-circle. Turn the telescope half round, when the level will be directly above the declination axis. Then, if the bubble run towards one end, bring it half way back by the screws which raise one of its supports, and the other half by the tangent screw of the hour-circle. The process must be repeated till it is satisfactory. The level itself is to be adjusted, as all levels are, by reversing it end for end on its cylinders.

6th. The instrument having been placed in the meridian, and clamped there, the hour circle verniers, or microscopes, are to be set to mark 0h. If the observer have the means of getting his time with tolerable accuracy, he may perfect this adjustment thus: Clamp the instrument approximately in the meridian, observe the transit of one or more known stars not far from the equator, and correct the time of observation for the known error of the clock. Then, as the right ascension of the star − true sidereal time of observation = true hour angle from the meridian, the true hour angle is known, and the verniers, or microscopes, may be set to mark it. Or the declination axis may be set horizontal by the level, when, if the previous adjustments have been properly performed, the instrument is in the meridian, and the verniers or microscopes set to mark 0h.

By attending to these rules and repeating the operation (stars near the pole may be safely used the second time), the instrument will be found to be very nearly in adjustment, and it is desirable that it should be so. The computation of instrumental corrections is tedious and perplexing, and most ordinary observers would blunder in the attempt; after all, the results of an equatorial, used as an *independent* instrument, are little to be relied upon. Except for observations of N.P.D. near the meridian, in reversed positions of the polar axis, as described in the first and second adjustment, the best equatorial must always be inferior to an indifferent vertical circle. Out of the meridian the careful observer will always use it as a differential instrument, which is its peculiar destination.

In the rules above given it will be remarked that the observer is directed, in every case but the 3rd, to place the instrument nearly in the meridian. This is the most favourable position of the instrument in its ordinary construction as regards symmetry and strength. Besides this advantage, the computation for refraction in or near the meridian is very simple, being the same in N.P.D. as in zenith distance*, while it is 0 in R.A. For the third adjustment the formula of computation, where great accuracy is not required, is refraction = 57.7″ × tang. N.P.D. of star, or the ordinary formula for refraction in altitude, using the star's polar distance instead of its zenith distance. The formula is more accurate the nearer the star is to the pole, but in these latitudes will be sufficiently correct if the N.P.D. do not exceed 80°. An adjustment within 10″ may be considered to be close enough for all practical purposes.

The equatorial, being thus adjusted, is ready for use, and may be turned upon any star at pleasure. Suppose it is required, at sidereal time 13h 14m, to find a star, the R.A. of which is 17h 33m, N.P.D. 67° 29′. As the R.A. of the star is greater than the sidereal time, the star has not yet come to the meridian, or the hour angle is east. Subtracting 13h 14m from 17h 33m, we have 4h 19m for the east hour angle. Turn the telescope to the east, and set to the reading 12h − 4h 19m, or 7h 41m of the hour-circle*; then set the declination circle to 67° 28′ N.P.D., and the star will be nearly in the centre of the field. With a little habit an observer can make an approximate allowance for refraction by taking away a few seconds from the hour angle and a minute or two from the N.P.D. If the star be very near the horizon, the usual course is to put on a low power in the telescope, and, having thus found the star, to set the telescope exactly upon it, and then to apply the power best adapted to the observation in view. The telescope being clamped in N.P.D. will follow any star by moving the instrument round in R.A. with an angular velocity equal to the apparent motion of the heavens. This motion is best given by clockwork, which is now coming pretty generally into use; and, indeed, for the measurement of double stars, the observation of occultations, eclipses of Jupiter's satellites, and all optical and micrometrical purposes, is nearly indispensable.

It is not necessary actually to correct each adjustment before proceeding to the next, and the errors in R.A. may be determined at the same time with those in N.P.D. by any person who understands the mysteries of a simple equation and the *law* of the errors. As the subject has not, we believe, been treated very satisfactorily, at least in any English publication, we shall proceed to deduce the errors and corrections of an equatorial every way out of adjustment from observations.

July 6, 1836.

Star	Face of Dec. Circle.	Sidereal Time.	Observed Hour-Circle.	Observed N.P. Distance.
		h. m. s.	h. m. s.	° ′ ″
β Urs. Min	E.	14 53 14.5	0 2 46.6	15 15 15
Ditto . .	W.	15 4 52.8	0 14 18.8	15 8 55
α Urs. Maj.	W.	17 1 5.0	6 6 46.9	27 16 52
δ Aquilæ .	W.	19 16 11.8	0 2 15.2	87 11 21
Ditto . .	E.	19 20 41.3	0 13 48.4	87 17 36

The sidereal time is corrected for the error of the clock, and the mean readings of the hour-circle and declination circle are corrected for refraction.

The instrumental N.P. distances, instrument east, are larger than those, instrument west, and the difference is

for β Ursæ Minoris	.	6′ 20
for δ Aquilæ .	.	6 15
Mean		6 17.5 = double index error,

or the index error is 3′ 8.7″ to be *subtracted* inst. E, and *added* inst. W.

Again taking the mean of the N.P.D. inst. E. and W.

	Inst. N.P.D. ° ′ ″	N.A. Alm. ° ′ ″	Differ. ′ ″
β Ursæ Minoris	15 12 5.0	15 10 17	1 48
δ Aquilæ .	87 14 28.5	87 12 23	2 5.5
		Mean	1 56.7

and as the instrumental exceeds the true N.P.D. and both stars are above pole, it follows that the pole of the instrument is *below* the pole of the heavens.

α Ursæ Majoris is nearly in the 6 hour meridian west, and therefore in a proper position for determining the azimuthal deviation of the pole; we shall suppose it is exactly at 6 hours from the meridian. Correcting for the index error, we have 27° 16′ 52″ + 3′ 9″ = 27° 20′ 1″, for the instrumental N.P.D., whereas the Nautical Almanac gives the true N.P.D. of this star = 27° 21′ 42″. The difference is 1′ 41″, which is the quantity by which the pole of the instrument is to the west of the pole of the heavens. We have therefore determined the error of the polar axis and the index error of the declination circle, which may be corrected, if necessary, by altering the screws.

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* The correction for N.P.D. may be taken from any of the tables, as the [illegible] is added to the N.P.D. of the star after subtracting the [illegible] and adding [illegible]. The correction is [illegible] when the star is between the pole and zenith.

* The hour angle reckoned from the meridian is always the difference between the sidereal time and the R.A. of the star. When the sidereal time is less than the R.A. of the star, add 12h to the sidereal time, and then, after subtracting the R.A. of the star, you have the reading of the hour-circle according to the graduation into two twelves. If the graduation is from 0h to 24h, add 24h instead of 12h to the sidereal time, and subtract the R.A. as before.

δ Aquilæ is very near the equator, and therefore proper for determining the error of collimation in R. A. The sidereal time between the observations is 11ᵐ 29ˢ.5, and the difference between the readings of the hour circle is 11ᵐ 33ˢ 2, hence the error of collimation in the equator is $\frac{3^s.7}{2}$ or 1ˢ.85 which is to be added to the hour angle of the observation, Inst. W., and subtracted, Inst. E. For stars out of the equator this correction is to be multiplied by the secant of declination. Now the secant of declination for β Ursæ Minoris = 3.82, hence the effect of collimation for this star = 3.82 × 1ˢ.85 = 7ˢ.1 nearly, and subtracting this from the hour angle of the first or E. observation and adding it to the second or W. observation, we have E. 0ʰ 2ᵐ 49ˢ.5 and W. 0ʰ 14ᵐ 23ˢ.9 for the hour-circle readings corrected on account of collimation. The difference between these is 11ᵐ 34ˢ.4, while the sidereal time elapsed is 11ᵐ 39ˢ.3, and half the discordance between these two results $\frac{4^s.9}{2}$ or 2ˢ.45 is the error due to the inclination of the declination axis. As this error varies as the tangent of declination, which in β Ursæ Minoris = 3.69, the error for any other star $= \frac{2.45}{3.69} \times \tan.\ \delta = 0^s.7 \times \tan.\ \delta$ nearly. It is evident that this correction is to be subtracted from the instrumental hour angle, Inst. E., and to be added, Inst. West. The sign is to be changed if the correction is to be applied to the sidereal time of the observation, that is, if the observer wishes to adjust his instrument (when it is E., for instance), he must make the time of passage later than it is, which is done by lowering the west end of the declination axis. In this case the quantity is 0ˢ.7 or 10″.5.

No considerable error arises from omitting the effect of inclination upon δ Aquilæ in the above example; but it is more satisfactory to deduce both the coefficients of collimation and inclination at once. Let *c* be the constant of the correction for the collimation and *i* for the inclination, both + when Inst. W. and when the correction is to be applied to the hour angle; then substituting the numerical values of the secants and tangents of the two stars, we shall have for the corrected hour angles

```
                        h.  m.  s.
β Ursæ Minoris E. 0   2  56.6−3.82c−3.69i
      „             W. 0  14  16.8+3.82c+3.69i
                  ─────────────────────────────
     Difference -  -  11  20.2+7.64c+7.38i = 11ᵐ 39ˢ.3.
   δ Aquilæ, W. 0ʰ  2ᵐ 15ˢ.2+1.00c+0.05i
                  E. 0  13   48 .4−1.00c−0.05i
                    ─────────────────────────
        Difference 0  11   33 .2−2·00c−0.10i=11ʰ 29ᵐ.5,
```

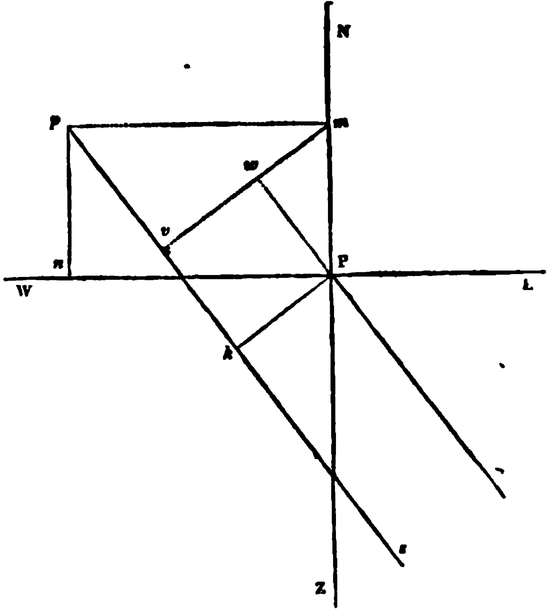
which give for the determination of *c* and *i*

$$7.64c + 7.38i = 19.1$$
$$2.00c + 0.10i = 3.7$$

from which *i* is found = 0.71 *c* = 1.81 nearly as before.

In this way, by forming an equation for each star, and combining all the observations in which *i* has a small coefficient into one equation (when stars have south declination, or are sub polo, the coefficient is negative), and those where the coefficient of *i* is large into another, the value of *i*, and consequently of *c*, may be determined with great accuracy. It is not absolutely necessary that the observations for deducing these corrections should be near the meridian, but it is desirable that as little time as possible should elapse between each of the pair of observations, on account of the variation of refraction and of the effect of polar error, if that be considerable. As a general rule, it would be well to keep within a few minutes of the meridian, for in the above example the variation of refraction in β Ursæ Minoris is 0ˢ.5, while the variation of the effect of polar error is no less than 1ˢ.3. Besides, the instrument is always most perfect near the meridian, and is to be used there when possible.

If the errors be corrected by adjustment, the index error of the hour-circle is simply the difference between the observed hour angle and the true hour angle. Or supposing the true sidereal time unknown, the index error must be determined by a level, as we have described above, after placing the declination axis horizontal. But if instead of actually adjusting the instrument, the errors are noted and *corrections* applied, we have yet to compute the effect of polar deviation upon the observations in R. A. before the index error can be correctly obtained. In order to do this, we must consider the polar deviation more minutely; and as we have reason to think that from a want of skill detecting the polar error of an equatorial, or in applying the corrections which depend upon this error to observations, especially in R. A., observers have been led to impeach too hastily the character of instruments, we shall explain this part of the subject very fully.



Let P be the place of the pole of the heavens and *p* that of the pole of the instrument when prolonged indefinitely, as seen on the sphere of the heavens by a spectator outside, N P Z the meridian of the place, which, when produced towards Z, passes through the zenith and the south point of the horizon; E P W, the 6-hour meridian, which passes through the east and west points of the horizon. Let *p m* and *p n* perpendicular on Z N and E W, and let *p* or P *n*=*x*″ and *p n* or P *m*=*y*″. It is presumed that the index error of the declination circle has been obtained by reversed observations, which is indeed the universal rule, and therefore that the observed N. P. distances, corrected for index error and refraction, express the actual distances of the stars from *p*.

Let a tolerably distant star be observed, the place which is in the direction of *p s* when continued; draw P perpendicular to *p s*, and also P S from the true pole towards the star, hence Z P S is the true hour angle of the star.

Then since the instrument is nearly in adjustment the star not very near the pole, P S and *p s* are nearly parallel, and P*k* is perpendicular to both, hence the distances of the star from P and *k* are equal, and the effect of error on the N. P. D. of the star is to make its instrumental polar distance too large by *p k*. Drawing *m v* perpendicular and P *w* parallel to *p s*,

$$pk = pv + vk \text{ or } Pw$$
$$= pm \times \cos.\ mpv + Pm \times \cos.\ mPw;$$

or, since *m p v* is the complement of *n p v*, which is = Z P S, and *m* P *w* = Z P S,

$$pk = x'' \times \sin.\ \text{east hour angle} + y'' \times \cos.\ \text{east hour angle}$$

From this formula if *x* and *y* be known in quantity and direction by observations in the meridian and at six hours from it, the value of *p k* may be computed and applied as a correction to the observed N. P. D. of any star, and the observed hour angle will serve for the computation.

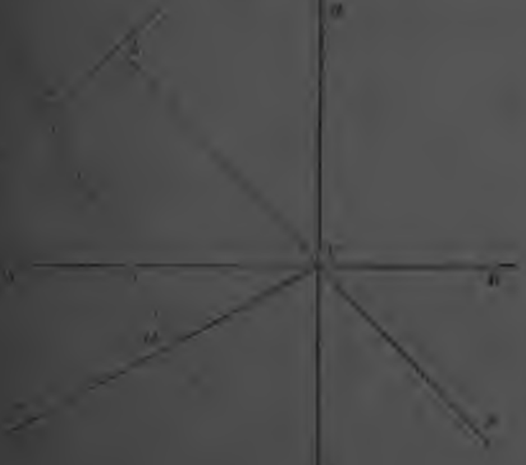
In practice we have found it sufficiently accurate to draw *p n* P on a scale where seconds are visible, *i.e.*, equal to about 1/[illegible] inch, and then making the angle *n p s* equal the observed hour angle, and letting fall P *k* perpendicular on *p s* to ascertain the value of *p k* by compass and scale. It is not possible to commit an error of more than 2″ or which is generally of little importance; and besides the superior rapidity of the operation, there is no danger of confounding the *sign* of either part of the correction, whether the star be above or below pole, which even careful and experienced computers can scarcely at times avoid. In any case the graphical process will afford a very useful check.

The effect of the displacement of the polar axis upon the readings of the hour circle may easily be gathered from the same figure. Suppose the two lines P h and p s to be continued till they meet at the star, and to be produced, if necessary, until they cut the equator in Σ and σ. The reader may imagine or draw the figure. If the star be north of the equinoctial, the lines P h Σ and p s σ cross at the star, and the hour angle corresponding to p is to the east, and greater than the hour angle corresponding to the true pole P. Hence the reading of the hour circle is too small in the case represented in the figure, or Σσ is to be added to the reading of the hour circle. Also, since σΣ : P h :: sin. δ : cos. δ ∴ σΣ = P h × tan. δ. Again,

$$
\begin{aligned}
P h &= m y - m n \\
&= p m \times \sin. m p n - P m \times \sin. m P n \\
&= x'' \times \cos. \text{ east hour angle} - y'' \times \sin. \text{ east hour angle.}
\end{aligned}
$$

The reader will have no difficulty in following out the rules with regard to the signs of the correction in each particular case, but it will be much safer and quite accurate enough to take the value of P h from the figure and to multiply it by $\frac{1}{15}$ tan. δ for the correction. As a practical direction we have found this convenient. Join P p, and produce it both ways. Then according to this figure, the correction is additive to the hour circle reading for all stars having north declination which are observed on the south side of P p produced, and *vice versa* for stars on the north side. The tangent of declination is negative when the star is south of the equinoctial, and the rule is reversed. There is no correction for stars in the direction of P p, that is for stars having an east hour angle from the south or a west hour angle from the north, such that its tangent $= \frac{x}{y}$. After this correction has been applied, the index error of the hour circle may be deduced in the manner pointed out.

It sometimes happens that an observer, from carelessness or want of time or knowledge, does not determine the position of the pole of the instrument by the best means, viz., by observations in the meridian and at 6 hours from it, but that this position is to be deduced from a higgledy piggledy mass of observations made in different parts of the heavens. To form equations such as we have just given for each observation, and to solve them by the method of minimum squares, might possibly be the most accurate mode; but the labour would be very great, and on such an object very much misspent. We have found the graphical process quite sufficient, and it has the further advantage of exhibiting to the eye those observations which, from their discrepancies, are probably errors in bisecting the star or in reading off the verniers. Suppose such a set of observations to be given for reduction. Draw W E and N Z, figure 2, at right angles to each other, and intersecting at P, and then draw from P lines such as P S, P S′ for each known star observed, making the angles S P Z, S′ P Z equal to the observed hour angles of the stars. If the instrumental polar distance be less than that of the catalogue, as in S′, take P h′ = the difference; if the instrumental distance be greater, as in S, produce S P and take P h = the difference. Through h and h′ draw perpendiculars to P S and P S′, and these will intersect at p, the place of the instrumental pole. Repeating this process for each known star, the eye will show pretty nearly where p should be chosen among the various intersections. The place of p being determined, the observations of an unknown star or comet may be corrected as shown above; and by dropping perpendiculars on P W and P N, the azimuthal and vertical errors of the pole of the instrument may be determined.



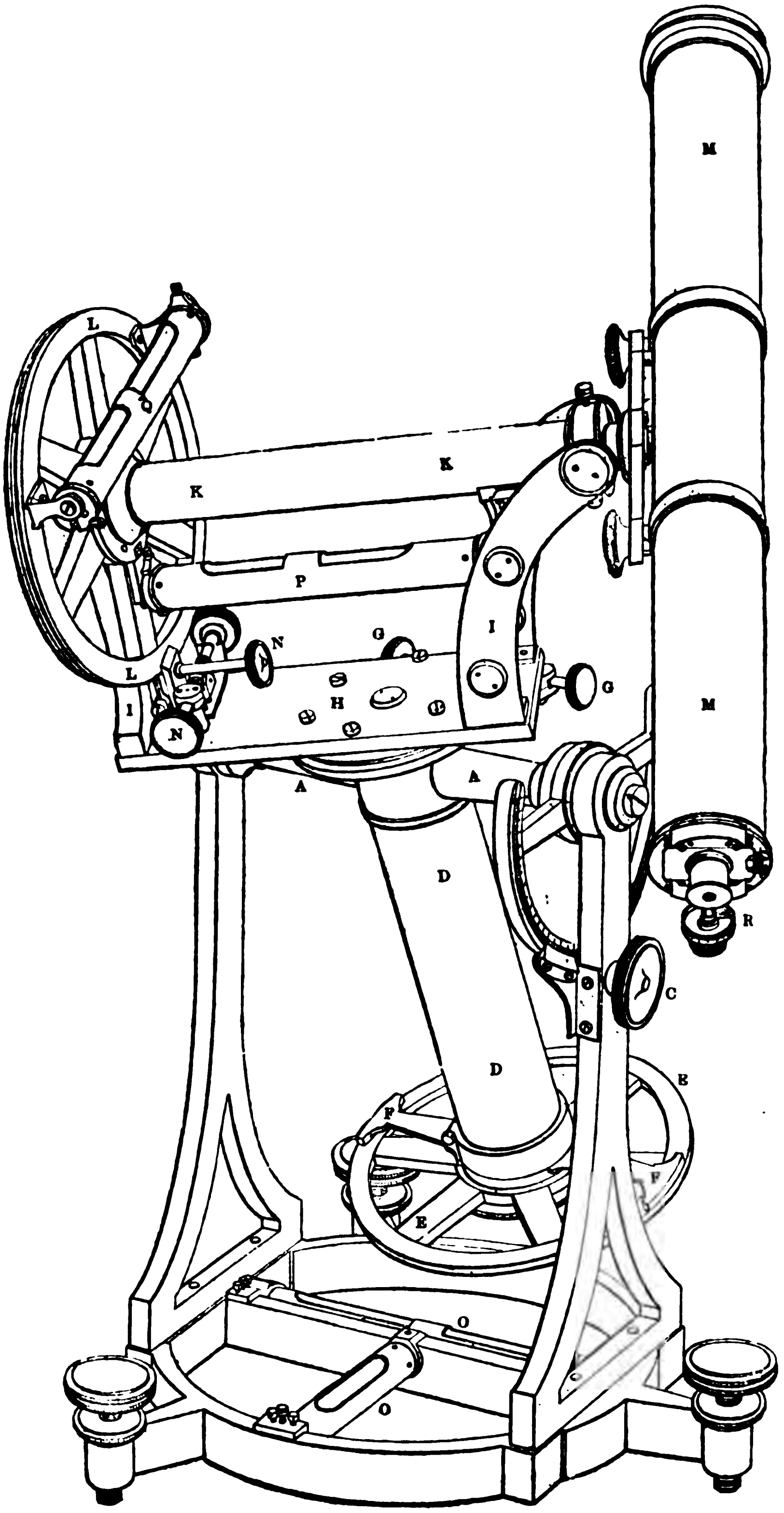
It seems scarcely necessary to caution any person into whose hands such observations may come, against relying upon intersections which are made at very acute or very obtuse angles. If, for instance, we were to attempt to deduce the place of p as to azimuth by a pair of observations near the meridian, or its place as to altitude by observations near the 6 hour meridian, we should only have our own folly to blame for the inaccuracy of the result. From the nature of the case, the unavoidable errors of observation would be multiplied by the process, and a result of any kind might be obtained, just as by observing the sun near noon for time and near the prime vertical for latitude, a sailor might cause his sextant to be guilty of any assignable error. This is evident from the form of the analytical equation, but any non-algebraist may satisfy himself by drawing lines P S and P S′, making an angle of 5° or 10°, and by finding what the effect of an error of 10″ in the observations will be on the position of p. If three observations of stars without reversion should be employed, and the index error of the declination circle be deduced at the same time, the blunder will be complete.

Though the errors of an unadjusted equatorial may be detected and the corrections rigorously computed, it would be an abuse of time and calculation to do so. In two of the ordinary constructions of the instrument and probably in the third, the instrumental errors are not and cannot be expected to be accurately the same in all positions of the instrument. In those equatorials of Ramsden's construction which have five feet telescopes and declination circles of three feet diameter, variations of adjustment between the meridian and six hours from it may be expected to amount to 10″ or 20″, and in the largest equatorials, which are necessarily more imperfect, discrepancies of 1′ or even 2′ may arise. We shall now point out the rational mode of using an equatorial instrument, when the object is to determine the place of any phenomenon in the heavens.

The first thing is to adjust the instrument with great care, and especially to make the pole of the instrument agree with the celestial pole. The permanence of this adjustment depends solely upon the steadiness of the upper and lower supports, which should therefore be fixed very solidly. This being done, suppose a comet is to be determined. Turn the telescope upon it, and having clamped the hour circle very firmly, note the transit of the comet over the vertical wires, bisecting it at the same time in N.P.D. by the horizontal wire. Wait till some other star passes over the field, note its transit, and bisect it in N.P.D. by moving the micrometer screw only. In this case the declination circle is supposed to be firmly clamped between the observations. Then the difference of the times of observation gives the difference of R.A. between the comet and star, and the difference in declination is taken from the micrometer. It is the same thing, of course, whether the star precedes or succeeds the comet. Observations of this kind are amongst the most perfect which can be made, for the errors of the instrument being the same in each case, and the refraction almost the same, no error can creep in except that of noting the phenomenon. The star which is sometimes called the determining star, or the star of comparison, is afterwards observed by meridian instruments, and then the place of the comet is deduced with the greatest accuracy. Frequently, however, there is a dearth of stars of comparison, and the time before a proper star enters the field is too long for the patience of the observer, or he may not have a micrometer. In this case the instrument is kept clamped in R.A., and after observing the comet, the telescope is moved up or down a little, and stars above and below the comet are observed, in

R.A. by noting the clock, and in declination by reading the circle. The instrument should then be turned half round in R.A., and the operation repeated. By combining both sets, as good a place of the comet will be deduced as the division of the declination circle will allow. The stars of comparison are taken above and below, so that the mean of the instrumental errors at the stars may be pretty nearly equal to that at the comet, and as the effect in R.A. of an error of collimation or inclination is changed in sign by reversion, it is therefore eliminated from the mean. The instrument must on no account be moved in R.A. between the observation of the comet and the stars of comparison. In this way Halley's comet was observed at Greenwich and Cambridge on its late appearance, the stars of comparison were subsequently observed with the meridian instruments, and the apparent places of the comet finally settled. The details will be found in the observations of the respective observatories for the year 1835.

If the utmost accuracy be not required, it is sufficient, after careful adjustment, to note the transit of the comet over the vertical wires, and to read off the declination and hour circle, and then turning the instrument upon one or



Equatorial.

more neighbouring stars, to observe them in like manner. The nearer the stars of comparison are to the comet, the greater probability there is that there is no change, or only a slight change of instrumental error in moving from one to the other. This mode of observation however is only to be tolerated in cases of necessity, when, either from haste or uncertain weather, the observer cannot wait for stars coming to the same meridian with the comet.

Suppose the following observations to have been made of Arcturus and an unknown star or comet, after correcting each for refraction:

	Time by clock. h m s	Hour Circle. h m s	North Polar Dist. ° ′ ″
Arcturus	17 17 8.0	3 10 13.6	69 54 46
Comet	17 27 11.5	2 50 38.1	62 11 1

To determine the index errors of both circles by Arcturus, we have

	h m s		° ′ ″
Time by clock	17 17 8.0	Instt. N.P.D.	69 54 46
Hour angle west	3 10 13.6	Do. Naut. Alm.	69 44 55
Instrumt. R.A.	14 6 54.4	Instt. N.P.D. *too small*	9 51
R.A. Naut. Alm.	14 8 10.6		
Instt. R.A. *too small*	1 16.2		

Applying these corrections to the observations of the comet, we have

	h m s		° ′ ″
Time by clock	17 27 11.5	Instt. N.P.D.	+62 11 1
Instt. hour angle	2 50 38.1	Correction	+ 9 51
Instt. R.A. comet	14 36 33.4	N.P.D.	+62 20 52
Correction	+ 1 16.2		
True R.A. comet	14 37 49.6		

The star of comparison is, in this case, much too distant both in R.A. and N.P.D.; and the index error ought to be determined by stars above and below the comet, and preceding and succeeding it. Also, after the observations have been made in one position of the instrument, it ought to be turned half round and the observations repeated; but the mode of ascertaining and applying the corrections is the same, and needs no further explanation.

The accompanying figure represents the portable universal equatorial as constructed by Troughton: (a drawing and description of a similar instrument, under the title of Fayrer's Equatorial, will be found in Rees's *Cyclopædia*, article *Equatorial*). The lower part or stand rests on three foot-screws, and needs no description. The upper part is moveable on a cross axis, A A, on which it is balanced; and when the polar axis is set at the proper inclination by the latitude semicircle B, the clamp C retains it there. The polar axis consists of an outer tube, D D, forming one piece with the horizontal axis above-mentioned, and of an interior axis which turns freely within the tube as in a socket. This latter axis carries the hour circle, E E, the verniers, F F, being fixed to the tube. The clamp and tangent screw of the hour circle are partially seen at G G. The upper plate H is fixed on the inner axis, and revolves with it. Two pieces, I I, rise from this plate, and carry the collars within which the cross or transit axis, K K, works. The declination circle, L L, and telescope, M M, are fixed to the extremities of the transit axis, the telescope being outside the collar. The declination clamp and tangent screw are seen at N N; the verniers are on the other side. These are attached to the support which rises from the plate H. Two levels are fixed on the lower part of the stand at O O, but they are only to be used for approximate adjustment. A delicate swing level, P, is hung from the transit axis, and a second level, Q, is fixed to the declination circle. The telescope has a micrometer, R, carrying wires for measuring small differences of declination.

It is evident to those who know Fraunhofer's construction, that it is identical with the upper part of this universal equatorial. The suspension and motion of the polar axis and hour circle are the same as in the equatorial made by Troughton for the University of Coimbra. The position of the telescope is that of Magellan and Nairne.

The rules we have already given will enable any one to adjust the universal equatorial; but if the direction of the meridian be known, it is a simpler plan to adjust the instrument as an altitude and azimuth circle, which it becomes when the polar axis is vertical, and then by inclining the polar axis to the latitude of the place, it becomes an equatorial. There is no provision in the instrument itself for moving the polar axis in azimuth. The whole must be turned bodily, and for this purpose some preparation should be made in the stand on which the foot-screws rest.

The following references will be useful to the reader. A clock for carrying an equatorial, constructed by Messrs. Troughton and Simms, and now in the possession of Charles Holford, Esq., of Hampstead, is described in the *Abstracts of the Proceedings of the Royal Astronomical Society*, vol. iii., No. 6, with a wood-cut. This would probably act somewhat more steadily with a horizontal fly-wheel upon the vertical axis, but its performance is very good. An account of the slipping piece and the wire micrometer to be applied to the equatorial for observing double stars, with directions for their use, is given in the appendix to the *Companion to the Maps of the Stars published by the Society*, 1836. For the mode of using an equatorial as a measuring circle, see the *Cambridge* and *Greenwich Observations* for 1835 and 1836 of Halley's Comet, of the Solar Eclipse, and of the elongation of Jupiter's fourth Satellite; and for the corrections for refraction and parallax, *the Introduction to the Greenwich Observations*, 1836, to which the reader should look if he wishes to know the best methods of making and reducing astronomical observations in general. Sir George Shuckburgh's *Memoir* already referred to contains a valuable history of the instrument, though, on consulting the authorities, we have been led occasionally to differ from him. A description of Ramsden's *refraction piece* will be found at page 19 of Shuckburgh's paper, along with a collection of tables for computing the effects of refraction and parallax in R.A. and N.P.D. from the data which this ingenious appendage affords. Pearson's *Practical Astronomy*, vol. ii. p. 517; Littrow, *Memoirs of the Astronomical Society*, vol. ii. p. 45; Kriel, *Mem. Ast. Society*, vol. iv. p. 495. We have committed an oversight by relying on Vince. Graham's astronomical sector is supported as Hooke's quadrant and Flamsteed's sextant: see Smith's *Optics*, § 885, book 3, chap. 9; but in explaining the instrument, Smith uses a figure for illustration, which Vince has copied as the actual instrument. It is now in the transit-room of the Royal Observatory.

EQUERRIES (from the French *écurie*, a stable), the name given to certain officers of the royal household in the department of the master of the horse, the first of whom is styled chief equerry and clerk-marshal. Their duties fall in rotation. When the king or queen ride abroad in state, an equerry goes in the leading coach. They formerly rode on horseback by the coach-side. Officers of the same denomination form a part of the established households of the royal dukes, &c.

EQUIANGULAR, EQUILATERAL, EQUI-CRURAL, EQUI-TANGENTIAL, &c. &c., a class of words beginning with Equi, which, in composition forms an adjective expressive of the equality of two things spoken of. Thus equiangular means having equal angles, and so on. There is a certain liability to confusion, arising from mistaking between the application of such terms to different parts of the same figure and to different figures. Thus 'an equilateral triangle' must mean a triangle which has three sides all equal. But 'two triangles which are equilateral' may mean two triangles in which every side of the first has its equal among those of the second, the two not being separately equilateral. To avoid this, it is sometimes said that two triangles, such as have just been mentioned, are *mutually* equilateral.

EQUILIBRIUM (*æqua libra*), a state of rest produced by the mutual counteraction of two or more forces. The science of equilibrium is STATICS.

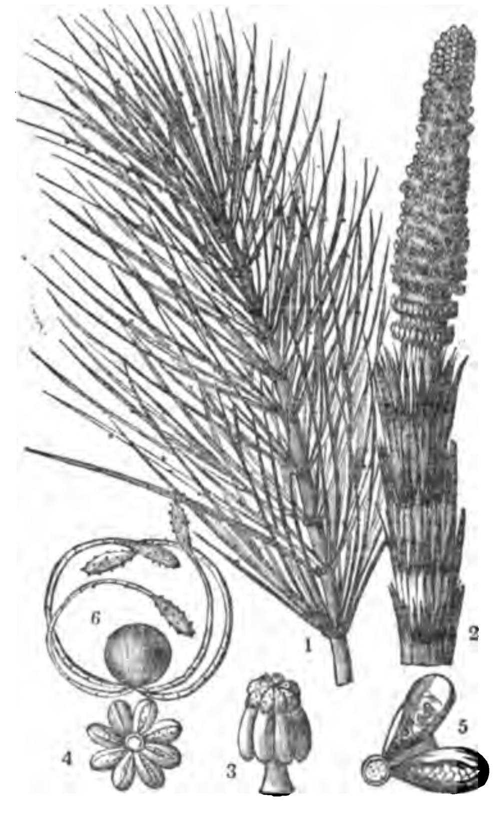
EQUIMULTIPLES, multiples in which equal numbers of times are taken. Thus *seven* times A and *seven* times B are *equi*-multiples of A and B; a league and a yard are equimultiples of a mile and a foot. The student of the fifth book of Euclid should remember that this word has no singular number: 7 A and 7 B are equimultiples, but 7 A is *not* therefore to be called *an* equimultiple but *one of the* equimultiples. And the same of the word equal, whether separately or in composition: A and B may be equal lines, but

A is not *an equal* line? Equality implies comparison of at least two things.

EQUINOCTIAL, a name given to the equator, from the night being equal to the day when the sun is there.

EQUINOXES, the intersections of the equator and ecliptic; the vernal equinox being that in which the sun is when about to rise into the northern hemisphere; the autumnal equinox being that in which the sun is when about to sink into the southern hemisphere. These terms are relative: for the equinox which is vernal in our hemisphere is autumnal in the southern, and *vice versâ*.

EQUISETA'CEÆ are imperfectly formed plants whose real affinity is uncertain, and the nature of whose parts of fructification is not yet understood. By Linnæus and almost all botanists they are referred to the Cryptogamic class; by a modern English botanist they are regarded as a low rudimentary form of Gymnosperms. Only one genus is known, the stems of which are employed in the shops under the name of Dutch rushes. They are hollow-stemmed leafless plants, with a cuticle composed of pure silex, which gives them the hard surface that makes them useful for the polisher's purpose. In lieu of leaves they have toothed sheaths, each of which has as many series of imperfect spiral vessels passing into fistulæ of the stem as there are toothings. Their fructification grows in terminal cones, consisting of stalked peltate scales, having on their lower side small cases wherein are lodged minute oval or round green bodies, surrounded by four elastic hygrometrical yellowish grey granulated clavate threads. By all botanists the central green body is admitted to be a seed or spore. The nature of the clavate threads is disputed; they are usually called elaters, and are compared to the elastic spiral threads bearing that name in Jungermanniaceæ; but there is no proof of such being their nature, and there is an opinion that they are rudimentary stamens. Be this as it may, the remarkable resemblance between Equisetaceæ and Casuarina, an undoubted flowering plant, the marked similarity of their cones of fructification to those of Cycadaceæ and Coniferæ, and the absence of such an evident correspondence between them and any existing or extinct forms of Cryptogamic plants, strongly inclines us to adopt the view of their being a low form of Phænogamous vegetation, bearing the same relation to Cycadaceæ as Lemna to palms and Ceratophyllum to arborescent nettles. Equisetaceæ are in English called horsetails, and are reckoned a sure sign of wet, stiff, springy soil.



1. A sterile branch of Equisetum fluviatile; 2, a fertile branch of the same in fructification; 3, one of the peltate scales; 4, the same viewed from below; 5, two of the cases very much magnified; 6, an ovule with the four supposed anthers.

EQUISE'TIC ACID, an acid discovered by Braconnot in the *equisetum fluviatile*, in which it exists combined with magnesia.

This acid may be obtained in small colourless radiating crystals; its taste is sharp, and somewhat analogous to that of tartaric acid: it is unalterable in the air. When heated it decomposes without subliming, and yields an oily uncrystallizable acid product. It dissolves readily both in alcohol and in water: the solution gives no precipitate either with lime or barytes water, but with acetate of lead and protonitrate of mercury it gives white curdy precipitates: it precipitates the persalts, but not the protosalts of iron.

With potash and soda it yields deliquescent uncrystallizable salts; with ammonia, a crystallizable salt. With oxide of zinc, with lime, and magnesia, it forms uncrystallizable transparent compounds, which are unalterable in the air.

E'QUITES (horsemen), the name of an order in the Roman state. Their origin, according to the old tradition, was this:—Romulus having divided his subjects into three tribes, chose from each one hundred young men whom he destined to serve on horseback and act as his body-guard; this body of cavalry was called the *celeres*, and afterwards the *equites*. (Dionys., ii. 13.) Niebuhr supposes (*Hist. of Rome*, i. p. 325, transl.) that whereas *patres* and *patricii* were titles of honour for individuals, *celeres* was the name of the whole class as distinguished from the rest of the nation. The three centuries of the *celeres* were called by the same names as the three tribes of the patricians, namely, Ramnes, Tities, and Luceres. Their tribunes are spoken of as a college of priests (Dionys., ii. 64), and it appears that the tribes of the patricians had also tribunes (Dionys., ii. 7). Moreover, when it is said that Tarquinius Priscus made three new centuries, which he added to the former three, and that the whole went under the name of the Sex Suffragia, or the six equestrian centuries, we cannot doubt that the alteration which he introduced was a constitutional, and not merely a military one; that in fact the centuries which he formed were, like the original three, tribes of houses; that his innovation was nothing but an extension of the political division of the inhabitants of Rome under Romulus. (Niebuhr, *Hist. of Rome*, i. p. 391.) When Servius Tullius established the comitia of the centuries, he received the sex suffragia, which included all the patricians, into his first class; and to them he added twelve other equestrian centuries, made up of the richest of the plebeian order. (Niebuhr, i. p. 427.) The antient writers appear to have laboured under some great confusion with regard to this arrangement. Livy (i. 43) makes a proper distinction between the twelve equestrian centuries created by Servius and the six which existed before; but when he states (i. [illegible]) that the cavalry in the reign of Tarquinius Priscus amounted to 1800, he appears to be antedating the origin of the eighteen equestrian centuries which formed part of the constitution of Servius. To the establishment of the comitia centuriata the creation of a body of equites, as a distinct order, seems to be due. The plan of Servius was, to a certain extent, identical with that of Solon. The object of both legislators was to break down the limits to which the old aristocracy was confined, and to set up an order of wealth by the side of the order of birth: not, however, that when a person could produce his 400,000 sesterces, he became *ipso facto* a knight, as was the case in after times. (Hor. *Ep.* i. 1, 57.) According to the Servian constitution, good birth or the sanction of the censors was necessary for gaining a place in the equestrian order. (Polyb., vi. [illegible]; Zonaras, vii. 19.) When Cicero says (*De Republica*, ii. [illegible]) that Tarquinius established the equestrian order on the same footing as that on which it stood in his own time, and also attributes to the same king the assigning of money to the equites for the purchase and keep of their horses, he is evidently inconsistent. In Tarquin's time, that is, before there was any plebeian order, it was natural enough that the poorer patricians, who were obliged to serve on horseback (just as the Ἱππῆς at Athens were a poorer class than the Pentakosiomedimnoi, Plut., *Sol.* c. 18.) should be furnished with the means for doing so. But the case was different with the equites after the establishment of an order of wealth. A man might then be of equestrian rank, and yet have no horse assigned to him; thus, on the one hand, we find at the time of the siege of Veii a number of equites serving on horseback at their own expense (Liv., v. [illegible] and, on the contrary, L. Tarquitius, who was a patrician, was obliged to serve on foot from his poverty. (Liv., iii. 27.) From this it appears probable that a certain sum was fixed which it was not necessary for every eques to have, but the possessor of which was obliged to serve on horseback at his own expense if no horse could be given him by the public, and that those whose fortune fell short of this were obliged to serve in the infantry under the same circumstances.

The lieutenant of the dictator was called 'the *chief* of the equites' (*Magister Equitum*); and although in later times he was appointed to this office by the dictator himself, it is probable, as Niebuhr conjectures (i., p. 569), that he was originally elected by the 12 centuries of Plebeian equites, just as the dictator, or *Magister Populi*, was by the *Sex Suffragia*, in other words, by the Populus or Patricians.

With regard to the functions of the equites, besides their military duties, they had to act as judices or jurymen under the Sempronian law: under the Servilian law the judices were chosen from the senate as well as from the equites: by the Glaucian law the equites alone performed the office, and so on by alternate changes till the law of Aurelius Cotta (B.C. 70), by which the judices were chosen from the senators, equites, and tribuni aerarii. The equites also farmed the public revenues. Those who were engaged in this business were called the *Publicani*; and though Cicero, who was himself of the equestrian order, speaks of these farmers as 'the flower of the Roman equites, the ornament of the state, the safeguard of the republic' (*Pro Plancio*, 9), it appears that they were a set of detestable oppressors, who made themselves odious in all the provinces by their avarice and rapacity.

The equites, as it may be inferred from what has been already said, gradually lost the marks of their distinctive origin and became, as they were in the time of Cicero for instance, an order or class of persons as distinguished from the senators and the plebs. They had particular seats assigned to them in the circus and the theatre. The insignia of their rank, in addition to the horse, were, a golden ring and the angustus clavus, or narrow band, on their dress, as distinguished from the latus clavus or broad band of the senators: the two last insignia seem to have remained after the Equites ceased to possess its original and distinctive character.

EQUITY, according to the definition given by Aristotle, is 'the correction of the law, when, by reason of its universality, it is deficient; for this is the reason that all things are not determined by law, because it is impossible that a law should be enacted concerning some things; so that there is need of a decree or decision; for of the indefinite the rule also is indefinite; as among Lesbian builders the rule is leaden, for the rule is altered to suit the figure of the stone, and is not fixed, and so is a decree or decision to suit the circumstances.' (*Ethics*, b. v. c. x. Oxford trans.) 'Equity,' says Blackstone, 'in its true and genuine meaning, is the soul and spirit of all law; positive law is construed and rational law is made by it. In this respect, equity is synonymous with justice; in that, to the true and sound interpretation of the rule.' According to Grotius, equity is the correction of that wherein the law, by reason of its generality, is deficient.

Until jurisprudence has become really a science based on settled principles, some such jurisdiction as our earlier law writers have attributed to the courts of equity is necessary to the due administration of justice; and it is probable that in England it deserved the humorous description given by Selden in his 'Table Talk:' 'Equity in law is the same that spirit is in religion, what every one pleases to make it; sometimes they go according to conscience, sometimes according to law, sometimes according to the rule of court. Equity is a roguish thing; for law we have a measure, know what to trust to; equity is according to the conscience of him that is chancellor, and as that is larger or narrower, so is equity. It is all one as if they should make the standard for the measure we call a foot a chancellor's foot; what an uncertain measure would this be! One chancellor has a long foot, another a short foot, a third an indifferent foot: it is the same thing in the chancellor's conscience.'

This uncertainty has however long ceased in that branch of our law which is expressed by the term Equity, and, from successive decisions, rules as strict and principles as fixed have been framed and established in our courts of equity as in our courts of law. New cases, it is true, may and do arise, but they are decided upon these ascertained rules and principles, and not from the notions of the judge as to what may be reasonable or just in the particular case before him. Nothing in fact is more common than to hear the chancellor say, that whatever may be his own opinion, he is bound by the authorities, that is, by the decisions of his predecessors in office and those of the other judges in equity; that he will not shake any settled rule concerning property, &c., it being for the common good that these should be certain and known, however ill-founded the first resolution may have been.

In its enlarged sense, equity answers precisely to the definition of justice, or natural law (as it is called), as given in the 'Pandects' (lib. i. 10. 1, l. 10, 11); and it is remarkable that subsequent writers on this so-called natural law, and also the authors of modern treatises on the doctrine of equity, as administered in the English courts, have, with scarcely any exception, cited the above passage from Aristotle as a definition of equity in our peculiar sense of a separate jurisdiction. But according to this general definition every court is a court of equity, of which a familiar instance occurs in the construction of statutes, which the judges of the courts of common law constantly interpret according to the spirit, or, as it is called, the equity, not the strict letter.

It is hardly possible to define equity as now administered in this country, or to make it intelligible otherwise than by a minute enumeration of the matters cognizable in the courts in which it is administered in its restrained and qualified sense. 'It is no longer,' says Sir James Mackintosh in his life of Sir Thomas More, 'in the acceptation in which the word is used in English jurisprudence, to be confounded with that moral equity which generally corrects the unjust operation of law, and with which it seems to have been synonymous in the days of Selden and Bacon. It is a part of laws formed from usages and determinations which sometimes differ from what is called common law in its subjects, but chiefly varies from it in its mode of proof, of trial, and of relief.'

In this country the remedies for the redress of wrongs and for the enforcement of rights are distinguished into two classes, *those which are administered in courts of law*, and *those which are administered in courts of equity*; the former are called legal rights and wrongs, the latter equitable. Equity jurisdiction may therefore properly be defined as that portion of remedial justice which is administered by a court of equity as distinguished from a court of law, from which a court of equity differs mainly in the subject matters of which it takes cognizance and in its mode of procedure and remedies.

Courts of common law in this country proceed by certain prescribed forms of action alone, and give relief only according to the particular exigency of such actions, by a general and unqualified judgment for the plaintiff or the defendant. There are many cases however in which a simple judgment for either party, without qualifications or conditions, or peculiar arrangements, will not do entire justice. Some modifications of the rights of both parties may be required; some restraints on one side, or the other, or perhaps on both; some qualifications or conditions present or future, temporary or permanent, to be annexed to the exercise of rights, or the redress of injuries. To accomplish such objects the courts of law in this country have no machinery: according to their present constitution they can only adjudicate by a simple judgment between the parties. Such prescribed forms of actions are not confined to our own system of laws; they were known in the civil law, and the party could apply them only to their original purposes. In other cases he had a special remedy. Courts of equity however are not so restrained; they adjudicate by decree pronounced upon a statement of his case by the plaintiff, and the answer of the defendant given in upon *oath*, and the evidence of witnesses, together, if necessary, with the evidence of all parties, also given upon oath. These decrees are so adjusted as to meet all the exigencies of the particular case, and they vary, qualify, restrain, and model the remedy so as to suit it to mutual and adverse claims, and the real and substantial rights of all the parties so far as such rights are acknowledged by the established rules of equity.

The courts of equity bring before them *all* the parties interested in the subject matter of the suit, and adjust the rights of all however numerous; whereas courts of law in this country are compelled by their constitution to limit their inquiry to the litigating parties, although other persons may be interested, that is, they give a complete remedy in damages or otherwise for the particular wrong in question as between the parties to the action, though such remedy is obviously in many cases an incomplete adjudication upon the general rights of the parties to the action, and fails altogether as to other persons, not parties to the action, who yet may be interested in the result or in the subject matter in dispute.

Perhaps the most general as well as the most precise description of a court of equity is the outline given by Mr. Justice Story in the 'Encyclopædia Americana,' which he has filled up in his recent Treatise on Equity. It is this—that a court of equity has jurisdiction in cases where a plain, adequate, and complete remedy cannot be had in the common law courts. The remedy must be *plain*, for if it be doubtful and obscure at law, equity will assert a jurisdiction. It must be *adequate*, for if at law it fall short of what the party is entitled to, that founds a jurisdiction in equity; and it must be *complete*, that is, it must attain the full end and justice of the case, it must reach the whole mischief and secure the whole right of the party present and future, otherwise equity will interpose and give relief. The jurisdiction of a court of equity is sometimes concurrent with the jurisdiction of the courts of law; sometimes assistant to it; and sometimes exclusive. It exercises concurrent jurisdiction in cases where the rights are purely of a legal nature, but where other and more efficient aid is required than a court of law can afford. In some of these cases courts of law formerly refused all redress, but now will grant it. For strict law comprehending established rules, and the jurisdiction of equity being called into action when the purposes of justice rendered an exception to those rules necessary, successive exceptions on the same grounds became the foundation of a general principle, and could no longer be considered as a singular interposition. Thus law and equity are in continual progression, and the former is constantly gaining ground upon the latter. Every new and extraordinary interposition is by length of time converted into an old rule; a great part of what is now strict law was formerly considered as equity, and the equitable decisions of this age will unavoidably be ranked under the strict law of the next. (Prof. Millar's *View of the Eng. Govt.*) But the jurisdiction having been once justly acquired at a time when there was no such redress at law, it is not now relinquished by the courts of equity.

The most common exercise of the concurrent jurisdiction is in cases of account, accident, dower, fraud, mistake, partnership, and partition. In many cases which fall under these heads, and especially in some cases of fraud, mistake, and accident, courts of law cannot and do not afford any redress: in others they do, but not in so complete a manner as a court of equity.

A court of equity is also assistant to the jurisdiction of the courts of law in cases where the latter have no like authority. It will remove legal impediments to the fair decision of a question depending at law, as by restraining a party from improperly setting up, at a trial, some title or claim which would prevent the fair decision of the question in dispute; by compelling him to discover, upon his own oath, facts which are material to the right of the other party, but which a court of law cannot compel him to disclose; by perpetuating, that is, by taking and keeping in its custody, the testimony of witnesses, which is in danger of being lost before the matter can be tried; and by providing for the safety of property in dispute pending litigation. It will also counteract and controul fraudulent judgments, by restraining the parties from insisting upon them.

The exclusive jurisdiction of a court of equity is chiefly exercised in cases of merely equitable rights, that is, such rights as are not recognised in courts of law. Most cases of trust and confidence fall under this head. This exclusive jurisdiction is exercised in granting injunctions to prevent waste or irreparable injury; to secure a settled right, or to prevent vexatious litigation; in appointing receivers of property, which is in danger of being misapplied; in compelling the surrender of securities improperly obtained; in preventing a party from leaving the country in order to avoid a suit; in restraining any undue exercise of a legal right; in enforcing specific performance of contracts; in supplying the defective execution of instruments, and reforming, that is, correcting and altering them according to the real intention of the parties, when such intention can be satisfactorily proved; and in granting relief in cases where deeds and securities have been lost.

Much discussion has taken place and various opinions have been expressed upon the question whether it would or would not be best to administer the whole of remedial justice in one court or in one class of courts without any separation or distinction of suits, or of the forms or modes of procedure and relief. Lord Bacon, upon more than one occasion, has expressed his decided opinion that a separation of the administration of equity from that of the common law is wise and convenient. 'All nations,' says he, 'have equity, but some have law and equity mixed in the same court, which is worse, and some have it distinguished in several courts, which is better;' and again, 'In some states, that jurisdiction which decrees according to equity and moral right, and that which decrees according to strict right, is committed to the same court; in others, they are committed to different courts. We entirely opine for the separation of the courts; for the distinction of the cases will not long be attended to if the jurisdictions meet in the same person; and the will of the judge will then master the law.'

Lord Hardwicke held the same opinion. Lord Mansfield, it is to be presumed, thought otherwise, for he endeavoured to introduce equitable doctrines into the courts of law. The old strictness has however been restored. His successor, Lord Kenyon, made use of these expressions: 'If it had fallen to my lot to form a system of jurisprudence, whether or not I should have thought it advisable to establish different courts, with different jurisdictions, and governed by different rules, it is not necessary to say; but influenced as I am by certain prejudices that have become inveterate with those who comply with the systems they find established, I find that in these courts, proceeding by different rules, a certain combined system of jurisprudence has been framed most beneficial to the people of this country, and which I hope I may be indulged in supposing has never yet been equalled in any other country on earth. Our courts of law only consider legal rights; our courts of equity have other rules, by which they sometimes supersede strict legal rules, and in so doing they act most beneficially for the subject.' In this country the principle of separating jurisdictions has been largely acted upon. We have our courts of equity and law; our bankrupt and insolvent courts, and courts of ecclesiastical and admiralty jurisdiction; indeed until lately our several courts of law had, in principle, jurisdiction only over certain special classes of suits. In countries governed by the civil law the practice has in general been the other way. But whether the one opinion or the other be most correct in theory, the system adopted by every nation has been mainly influenced by the peculiarities of its own institutions, habits, and circumstances, and the forms of its remedial justice. In all such cases the separation or union of the equitable and legal jurisdiction must be a mixed question of public policy and private convenience.

In some of the American states, the administration of law and equity is perfectly distinct; in others the administration of equity is only partially committed to distinct courts; in a third class the two jurisdictions are vested in one and the same tribunal; and in a fourth there are no courts exercising an equitable jurisdiction.

In most of our colonies the governor is invested with the jurisdiction of chancellor; but in some of the greatest importance where a judicial establishment of some magnitude is maintained, the chief or supreme court is invested with the chancery jurisdiction.

This attempt at the exposition of the general principles of what in this country is called equity seems to the writer of this article to be better suited to a work of this nature than a full description of the practice of, that is, the course of proceeding in a suit in, a court of equity. The practice or procedure of any court can hardly be made intelligible to any person but one who knows something of it by experience; and any technical description of it is useless unless it is minutely and circumstantially exact. It is desirable, however, that in addition to some knowledge of the subjects which belong to the jurisdiction of a court of equity, all persons should have some clear notion of the way in which the matters in dispute between parties to a suit in equity are brought before the court, and by what kind of proof or evidence they are established. It may also be useful that persons should have a general, and so far as it goes, a correct knowledge of the different modes in which such questions of fact are put in issue, and proved in our courts of law and equity. The following short outline of the course of proceeding in a suit of chancery, taken in connection with other articles in this work, such as CHANCELLOR, CHANCERY, DEPOSITION, EVIDENCE, and PLEADING, may probably, so far as it goes, give somewhat more information on the subject of equity jurisdiction than is found in books not strictly professional.

A suit on the Equity side of the courts of chancery and exchequer is commenced by presenting a petition to the lord chancellor, or the chancellor and barons of the exchequer, containing a statement of the plaintiff's case, and praying for such relief as he may consider himself entitled to receive. This petition is technically called a Bill, and is in the nature of the declaration at common law [DECLARATION]; but if the suit is instituted on behalf of the crown, or a charity, or any of the objects under the peculiar protection of the crown, the petition is in the form of a narrative of the facts by the attorney-general, and is called an information. There is also a petition termed an information and bill, which is where the attorney-general, at the relation (that is, the information) of a third person (thence called the relator), informs the court of the facts which he thinks are a fit subject of inquiry. The practice which governs all these proceedings is the same. It is the practice at the end of the statement in a bill to add what is called the interrogatory part, which consists of the statements of the bill thrown into the form of distinct questions, and often expressed in terms of great length and particularity. The statements in the bill are not made upon oath; and further, in order to obtain a full and complete discovery from the defendant, both as regards the complaint and the supposed defence, various allegations are made in many cases from mere conjecture, and this practice, it has been considered after much laboured discussion, tends to the due administration of justice; for though doubtless many frivolous suits are instituted, yet, from the nature of cases of fraud and concealment, the plaintiff is often ignorant of the precise nature of the case, and frames his bill in various forms so as to elicit from the defendant a full discovery of the truth. Bills of this nature are called original bills, and either may be for discovery and relief, or for discovery merely.

When the bill is placed on the records of the court it is said to be *filed*, and the writ of subpœna issues commanding the defendant to appear and answer the allegations of the bill within a certain time.

If, upon the face of the bill, it should appear that the plaintiff is not entitled to the relief prayed for as against the defendant, the defendant may demur, that is, demand the judgment of the court upon the statement made by the plaintiff, whether the suit shall proceed [DEMURRER]; and if any cause, not apparent upon the bill, should exist why the suit should be either dismissed, delayed, or barred, the defendant may put in a plea, stating such matter, and demanding the judgment of the court as in the case of a demurrer. But if neither of these modes of defence are applicable, and the defendant cannot disclaim [DISCLAIMER], he must answer upon oath the interrogatories in the bill according to the best of his *knowledge*, *remembrance*, *information*, and *belief*. This mode of defence is styled an Answer. All or any of these several modes of defence may be used together, if applied to separate and distinct parts of the case made by the plaintiff.

In the successive stages of a suit, references as to the pleadings, and as to facts, may be made to the Masters of the court; as for instance, if any improper statements be made reflecting upon the character of either party, not necessary to the decision of the suit, the pleading may be referred to the master for scandal; if there be long and irrelevant statements, not concerning the matter in question, a reference may be made for impertinence, and the matter so complained of as scandalous or impertinent may be expunged at the expense of the party in fault. Again, if the defendant does not answer the bill with sufficient precision, the plaintiff may except to the answer for insufficiency, and this question is decided by the masters, in suits in chancery, but by the court in the exchequer. If the answer is decided to be insufficient the defendant must answer further.

It frequently happens that during the progress of the suit, from the discovery of new matter, the deaths and marriages of parties, and other causes, the pleadings become defective, and in those cases it is necessary to bring the new matter, or parties becoming interested, before the court. This is done by means of further statements, referring to the previous proceedings, and being in fact merely a continuation of them, which are called supplemental bills, bills of revivor, or bills of revivor and supplement, according to the nature of the defect which they are intended to supply. These bills are called bills not original.

There is also a third class, called bills in the nature of original bills, which are occasioned by former bills, such as cross bills, which are filed by the defendant to an original bill against the plaintiff to the same bill, touching some matter in litigation in the first bill, as where a discovery is necessary from the plaintiff in order that the defendant may obtain complete justice. There are also bills of review, to examine a decree upon the discovery of new matter, &c., and several others. Upon both these latter descriptions of bills the same pleadings and proceedings may follow as to an original bill.

Pleas and demurrers are at once argued before the court: if allowed, the suit, or so much of it as is covered by the demurrer or plea, is at an end, though the court will generally permit the plaintiff to amend his bill where it is not apparent from his own statement that he cannot make any case against the defendant; otherwise the only object attained by the demurrer or plea would be to drive the plaintiff to file a new bill, omitting or amending the objectionable part. But if the demurrer or plea is overruled, the defendant is compelled to answer fully, just as if he had not demurred or pleaded. When the answer is filed, the plaintiff, if from the disclosures made he deems it advisable, may amend his bill, that is, erase such part of his statements as he no longer considers necessary, and insert other statements which may appear necessary to sustain his case; and the defendant must answer to this new matter.

In cases where the bill is for discovery only, and in some others, the answer puts an end to the suit; and when the object of the bill is to obtain an injunction, which is granted either upon affidavits before answer or in default of an answer, the suit is also ended, unless the defendant desires to dissolve the injunction. But where a decree is necessary, the cause must come on to be heard either upon evidence taken before the examiners of the court or commissioners appointed for the purpose [DEPOSITION, EVIDENCE]; or where the plaintiff considers the disclosures in the answer sufficient, the cause is heard upon bill and answer alone, without further evidence, and this is at the plaintiff's discretion.

The cause is heard in its turn by the master of the rolls or the vice-chancellor, if instituted in the Court of Chancery, for the lord chancellor rarely hears causes in the first instance [CHANCERY]; or if the suit is in the Exchequer, by the chief baron sitting in equity, or by any other of the barons sitting for him, as now authorized by Act of Parliament. If the nature of the suit admits, a final decree is made; or if any further inquiry be necessary or any accounts are to be taken, references are made to the master for those purposes.

The master being attended by the parties or their agents, makes his report; and the cause again comes on in its turn to be heard upon further directions (as it is called), when the like principles prevail as at the hearing.

This is the form of the simplest suit in equity, and is sufficient to point out the successive steps necessary to be taken; but generally suits are of a far more complicated character. Many special applications to the court may become necessary at various stages before the cause is ripe for hearing; and when reference is made to the master, the inquiries to be prosecuted before him may be entangled in the greatest confusion; and even when he has made his report, either party may *except* to it, and have his exceptions argued before the court. Also when the cause is heard on further directions, other references to the master may be found to be necessary, or may arise out of the circumstances stated in his report; the subject matter of the suit may be such as to prevent an immediate and final decree; a party may be entitled for life to the interest of money, and the persons to take after him may not be born or may be infants. In these and many other cases the court makes such decree as may be necessary, and retains the suit, giving liberty to any parties interested to apply to the court for directions as may become necessary from time to time. It is impossible here to give an adequate notion of the various and complicated operations performed by decrees, by which the interests and rights of all parties are settled, and the most embarrassed affairs are arranged. A very valuable collection of decrees has been published by Mr. Seton.

Those who wish for a more accurate knowledge of the proceedings in a suit in Chancery may consult Lord Redesdale's *Treatise on Pleading*; Beames *on Pleas*; and the various books on Chancery Practice.

The principal English treatises on Equity are those of Mr. Maddock and Mr. Fonblanque: the former treats of his subject under heads devoted to the several subject matters cognizable in courts of equity; the latter considers it with reference to the jurisdiction exercised by courts of law, as concurrent, assistant, exclusive. The American treatise of Mr. Justice Story unites these two modes, and explains the subject in a masterly and scientific manner.

EQUITY OF REDEMPTION. [MORTGAGE.]

EQUIVALENTS, CHEMICAL. [ATOMIC THEORY.]

EQUU'LEUS (the little horse), a constellation of Ptolemy surrounded by Pegasus, Vulpecula, Aquila, and Capricornus.

Character.	No. in Catalogue of		Magnitude.
	Flamsteed. Piazzi ().	Astron. Society.	
(ε)	1	2486	5
(λ)	2	2495	6
(ζ)	3	2500	6
	4	2503	6
γ	5	2510	4
δ	7	2515	4
α	8	2517	4
(η)	9	2527	6
β	10	2535	4
	(376)	2476	6
	(393)	2483	6

EQUU'LEUS PICTO'RIS (the painter's horse, or easel), a constellation of Lacaille, situated close to the principal star of Argo. [CANOPUS.] Its principal star (α) is 583 of Lacaille, and 856 in the catalogue of the Astronomical Society.

EQUUS. [HORSE.]

ERA. [ÆRA.]

ERA'NTHEMUM, a genus of acanthaceous plants with showy purple flowers, some of whose species are occasionally seen in hot-houses in this country. It has a salver-shaped corolla with a five-cleft nearly equal limb, a four-parted equal calyx, and only two out of its four stamens fertile. Eranthemum pulchellum and bicolor are the handsomest species in cultivation, and when skilfully managed produce a very striking appearance.

ERANTHIS, a small genus cut off from the old Helleborus, in consequence of its having a deciduous calyx, stalked capsules, an involucre to the flowers, and a totally different habit. E. hyemalis, or Winter Aconite, is a small stemless, tuberous, herbaceous plant, inhabiting shady places in the midland parts of Europe, and rendering our gardens gay in the earliest spring with its cups of bright yellow. It has peltate, many-cut, pale green, smooth leaves, and a single flowered scape only a few inches high.

Another species, E. sibirica, inhabits Siberia, but has not yet found its way into our gardens.

ERASMUS was born October 28, 1467, at Rotterdam, where a fine bronze statue of him, erected in 1622, still stands, and is accounted one of the chief ornaments of the city. He was the illegitimate son of a citizen of Gouda, named Gerrit (Gerard), which, according to a pedantic fashion of the day, he translated doubly into Desiderius Erasmus; and in future years he found time to lament his carelessness in calling himself Erasmus instead of by the more accurate form Erasmius. During his father's life he was well and tenderly educated; but at the age of 14 he fell into the hands of dishonest guardians, who wasted his patrimony, and, to conceal their peculations, drove him, very unwillingly, into a monastery. He took the vows at Stein, in 1486. Fortunately his skill in Latin caused him to be employed as private secretary to the bishop of Cambrai, who, in 1496, at the end of their connection, authorized him to proceed to Paris to continue his studies, instead of returning to the monastic life, which he hated. At Paris Erasmus barely supported himself by taking pupils, in sickness and poverty. For many years he led a wandering life, relying on the bounty of those patrons who were attracted by his learning and sprightly wit, sometimes in France, sometimes in the Netherlands, sometimes in England, to which he was a frequent visitor. In England he became intimate with More, Colet dean of St. Paul's, and other learned men, of whom he has spoken in high terms of praise: and England, if any permanent establishment had been offered, would have been the home of his choice. For several years he applied himself diligently to the study of Greek, which, after ages of general neglect, was just beginning to be an object of attention. He was *autodidactos*, self-taught, he says: and one of his favourite employments was the translation of short Greek treatises into Latin, which answered the double purpose of improving himself, and furnishing him with a number of books to dedicate to his wealthy friends; for in those days the honour of a dedication was generally acknowledged by a handsome present. Careless however of economy, and not averse to pleasure, Erasmus was continually in want; and in one of his letters (xii. 21) he duns Colet for fifteen angels, promised as the price of the dedication of his treatise 'De Copia Verborum.'

In 1506 Erasmus paid his first visit to Italy, during which he obtained from Pope Julius II. a dispensation from his monastic vows. At Bologna, Venice, and Padua, he improved his knowledge of Greek under the instruction of the best Greek and Italian scholars. At Rome he met with a flattering reception, and promises of high advancement; but having engaged to return to England, he did so in [illegible], in the expectation that the recent accession of Henry VIII., with whom he had for some time maintained a correspondence, would ensure to him an honourable provision. During this visit he resided for some time at Cambridge, where he was appointed Lady Margaret professor (in divinity) and also lectured on Greek; his lodging was in Queen's College, in the grounds of which Erasmus' Walk is still shown. But not finding his expectations likely to be fulfilled, he accepted an invitation from the archduke, afterwards Charles V., and went to Brabant in 1514, with the office of counsellor, and a salary of 200 florins. After this we find him resident sometimes in the Netherlands, sometimes at Basle, where the great work, in which he had been many years engaged, the first edition of the New Testament in Greek, was published in 1516, accompanied by a new Latin translation. Some amusing specimens of the objections made to the undertaking by the ignorant clergy will be found in his Letters (vi. 2).

At the dawn of the Reformation, Erasmus, who, in his witty writings had exposed many abuses of the Roman Catholic church, especially those connected with the monastic system, was much embarrassed. It is clear that at heart he went a long way with the reformers, whose tenets he cautiously abstains from censuring, even in letters to dignitaries of the church, where he speaks of Luther himself in no very friendly terms. But he was of a timid temper, disinclined to sacrifice either life or comfort to his opinions, for he says of himself, in a letter to Pace, dean of St. Paul's, 'Even if Luther had spoken everything in the most unobjectionable manner, I had no inclination to die for the sake of truth. Every man has not the courage to make a martyr: and I am afraid, if I were put to the trial, I should imitate St. Peter.' This backwardness brought on him some harsh rebukes from Luther, who nevertheless had esteem for his person as well as a regard for his talents; and calls him, in a letter written in 1519 (vi. 3) 'Decus nostrum et spes nostra' ('our glory and our hope'). Neither did the zealots of the other side regard him with much favour. Erasmus, it was said, laid the egg, and Luther hatched it; and no doubt the pungency of his satire had [illegible] effect in opening men's eyes, and preparing for the graver warfare of the great reformer.

He removed to Basle in 1521, where, in 1522, his celebrated 'Colloquies' were published. They were composed ostensibly to supply young persons with an easy school-book in the Latin language, and at the same time to teach them religion and morals. For the purpose of teaching the Latin language this little book seems peculiarly well adapted; it was long used for this purpose in England, in the northern parts of which it was, till very lately, in use, and perhaps still is in some places. In these Colloquies, which are generally very amusing, Erasmus has made some of his smartest attacks on various superstitions of the Roman Catholic church. On this account the book was prohibited. In

1529 Erasmus removed to Freiburg, when the reformed party acquired the ascendancy in Basle; for to the last he never threw off an external adherence at least to the ancient faith. But in 1535 he returned to his former place of abode, endeared as it was by the presence of his most valued friends, in hope of renovating his declining health. About this time he received testimonies of high respect from Pope Paul III., who gave him a benefice, and expressed the intention of raising him to the rank of cardinal. But these favours came too late to benefit him. He died at Basle, July 12, 1536, leaving an enduring reputation as the first wit of his age, the man of most general learning, and the most active and serviceable instrument in bringing about the revival of sound learning. Nor were his contributions small towards the success of the Reformation; he was an able sapper, though he wanted energy to storm the breach with Luther and his comrades.

His Encomium Moriae, 'Praise of Folly,' written in England in 1510, a very witty production, was meant to show that there are fools in all places, however high, even at the court of Rome. It had a great run, and Leo X. is said to have been much amused by it; but at the same time it made its author many enemies among those who loved the abuses or were too fond to see the faults of the church, and did more than any of his works, except the Colloquies, to fix the charge of heterodoxy on him. The 'Adagia' (1498), a large collection of proverbs, explained and commented upon with great learning, is another of his most interesting works. 'Enchiridion Militis Christiani' (1503) is a valuable manual of practical religion; the 'Ciceronianus' is an elegant and stinging satire on the folly of those pedants who, with a blind devotion, refused to use in their compositions any words or phrases not to be found in Cicero. Erasmus's own Latin style is clear and elegant; not always strictly classical, but like that of one who spoke and wrote Latin as readily as his mother tongue.

His Letters, comprising those of many learned men to himself, form a most valuable and amusing collection to those who are interested in the manners and literary histories of the age in which they were written; and several of them in particular are highly valuable to Englishmen as containing a picture of the manners of the English of that day.

Of his numerous works, those which we have mentioned are most likely to be read with pleasure in the present day; the rest of them consist chiefly of translations, theology, grammar, and occasional treatises addressed to his friends and patrons.

His greatest work however was the edition of the New Testament, in Greek, from manuscripts, for the first time: for though that portion of Scripture was printed in the Complutensian Polyglot as early as 1514, it was not published till 1522; while the Editio Princeps of Erasmus was published in 1516. It is much commended by Michaelis, who says, 'Natural abilities, profound learning, a readiness in detecting errors, with every qualification that is requisite to produce critical sagacity, Erasmus possessed in the highest degree; and perhaps there never existed a more able editor of the New Testament.' As an edition for common use, however, it is of course superseded, in consequence of the accumulated knowledge of later labourers, and the great improvement in biblical criticism.

Erasmus superintended the first Greek edition of the Geography of Ptolemy, which was printed at Basle by Froben, 1533, 4to. The edition was founded on good MS., but it contains numerous typographical errors.

There are lives of Erasmus by Knight and by Leclerc, the latter of whom published a complete edition of his works; and there are copious articles in most of the biographical dictionaries. Burigny's 'Vie d'Erasme,' 1757, 2 vols. 12mo., is strongly recommended, as containing in itself a literary history of Erasmus's time.

At Basle there is a portrait of Erasmus by Holbein (*Biog. Univ.*); there is one also in the hall of Queen's College, Cambridge, but by what artist we have not been able to learn. The best edition of the complete works of Erasmus is that of Leyden, by Leclerc, 1703, 10 vols. fol., often bound in eleven.

ERATO. [Muses.]

ERATOSTHENES, a distinguished contemporary of Archimedes, is stated to have been born at Cyrene in the year 276 B.C. He possessed a variety of talents seldom united in the same individual, but not all in the same eminent degree; his mathematical, astronomical, and geographical labours, are those which have rescued his name from oblivion.

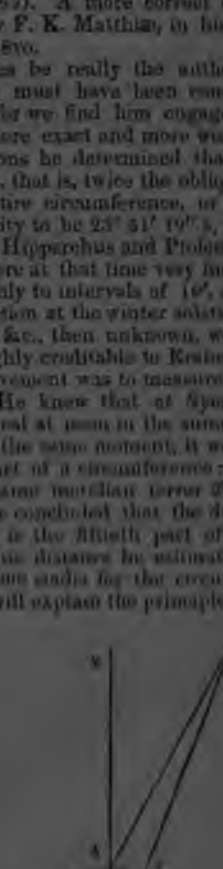
The Alexandrian school of sciences, which flourished under the first Ptolemies, had already produced Timocharis and Aristyllus, whose sidereal observations, made probably by the shadows of a gnomon, and by the armillary circles imitative of those of the celestial vault, retained considerable credit for centuries afterwards, though from those methods of observation they must have been extremely rude and imperfect.

Eratosthenes had not only the advantages arising from the instruments and observations of his predecessors, but the great Alexandrian library, which probably contained all the Phoenician, Chaldaic, Egyptian, and Greek learning of the time, was entrusted to his superintendence by the third Ptolemy (Euergetes), who invited him to Alexandria; and we have proof in the scattered fragments which remain to us of this great man, that these advantages were duly cultivated to his own happiness and the progress of infant astronomy.

The only work attributed to Eratosthenes which has come down to us entire, is entitled 'Catasterismi,' and is merely a catalogue of the names of forty-four constellations and the situations in each constellation of the principal stars, of which he enumerates nearly five hundred, but without one reference to astronomical measurements: we find Hipparchus quoted in it, and mention made of the motion of the pole, that of the polar star having been recognised by Pytheas. These circumstances, taken in conjunction with the vagueness of the descriptions, render its genuineness extremely doubtful; at all events it is a work of little value. It may be seen in the Oxford edition of 'Aratus,' and was republished by Shaubach, with notes by Heyne (Gött., 1795). A more correct edition of the text was published by F. K. Matthiæ, in his edition of Aratus, Frankfort, 1817, 8vo.

If Eratosthenes be really the author of the treatise 'Catasterismi,' it must have been composed merely as a 'vade me-cum,' for we find him engaged in astronomical researches far more exact and more worthy of his genius. By his observations he determined that the distance between the tropics, that is, twice the obliquity of the ecliptic, was $\frac{11}{83}$ of an entire circumference, or 47° 42′ 39″, which makes the obliquity to be 23° 51′ 19″.5, nearly the same as that supposed by Hipparchus and Ptolemy. As the means of observation were at that time very imperfect, the instruments divided only to intervals of 10′, and corrections for the greater refraction at the winter solstice, for the diameter of the solar disc, &c., then unknown, we must regard this conclusion as highly creditable to Eratosthenes.

His next achievement was to measure the circumference of the earth. He knew that at Syene (now Assouan) the sun was vertical at noon in the summer solstice; while at Alexandria, at the same moment, it was below the zenith by the fiftieth part of a circumference; the two places are nearly on the same meridian (error 3°); neglecting the solar parallax, he concluded that the distance from Alexandria to Syene is the fiftieth part of the circumference of the earth; this distance he estimated at 5000 stadia, which gives 250,000 stadia for the circumference; the following diagram will explain the principle of this admeasurement.



C the centre of the earth, A Alexandria, *s* Syene, S the sun, < ZAS the $\frac{1}{50}$ of four right angles, < ASC the sun's parallax, which is very small: ∴ < ACS is very nearly = ZAS; therefore distance A*s*C = $\frac{1}{50}$ of circumference of earth.

Thus Eratosthenes has the merit of pointing out a method for finding the circumference of the earth. But his data were not sufficiently exact, nor had he the means of measuring the distance A*s* with sufficient precision.

Eratosthenes has been called a poet, and Scaliger, in his commentary on Manilius, gives some fragments of a poem attributed to him, entitled 'Hermes, or de Zonis,' one of which is a description of the terrestrial zones: it is not improbable that these are authentic: the chroniclers as well as philosophers of all nations, in a state of incipient civilization, have called in the aid of metre to popularize their labours. Eratosthenes is therefore entitled to the name of a versifier rather than a poet, like his precursor Manetho, who wrote Ἀποτελεσματικά (effects or influences), a mixture of astrology and astronomy; one of whose lines, containing the names of the sun and planets, may be taken as a specimen—

Ζεὺς Ἄρης Παφίη Μήνη Κρόνος Ἥλιος Ἑρμῆς.

The wretched doggrel arising from forcing names, scientific terms and reasonings into verse, may be judged by some ridiculous productions of the kind in our own language.

That Eratosthenes was an excellent geometer we cannot doubt, from his still extant solution of the problem of two mean proportionals, preserved by Theon, and a lost treatise quoted by Pappus, 'De Locis ad Medietates,' on which Montucla has offered some conjectures, 'Histoire des Math.,' an. vii., p. 280.

Eratosthenes appears to have been one of the first who attempted to form a system of geography. His work on this subject, intitled 'Geographica' (Γεωγραφικά), was divided into three books. The first book contained a history of geography, a critical notice of the authorities used by him, and the elements of physical geography. The second book treated of mathematical geography, and contained the method above explained, by which he determined the earth's circumference. The third book contained the political or historical geography, arranged according to the three great divisions of the known globe, Europe, Asia, and Libya. The whole work was accompanied with a map of the known world. The geography of Eratosthenes is lost; the fragments which remain have been chiefly preserved by Strabo, who was doubtless much indebted to him.

Eratosthenes also busied himself with chronology. The reader will find some remarks on his Greek chronology in Clinton's *Fasti Hellenici;* and on his list of Theban kings, by R. Rask, in his little work on the antient Egyptian chronology, German translation, Altona, 1830.

The properties of numbers attracted the attention of philosophers from the earliest period, and Eratosthenes also distinguished himself in this branch by a work which he denominated Κόσκινον, *Cribrum*, or *Sieve*, the object of which is to separate prime from composite numbers, a curious memoir on which was published by Horsley in the 'Philosophical Transactions,' 1772. The principle of the method is to reject all the multiples of the primes, tabulating first all the odd numbers; the multiples of 3 will be found with intervals of two places, those of 5 with intervals of 4, and by placing a mark over each such multiple, none but prime numbers will remain after this sifting. The same method, which is indeed indirect, but comparatively rapid in application, has been employed by Ladislaus Chernac, in forming a table of primes from 1 to 1,020,000, in a treatise published in 1811; the following example will explain the method:—

3, 5, 7, $\dot{9}$, 11, 13, $\dot{1}5$, 17, 19, $\dot{2}1$, 23, $\dot{2}5$, $\dot{2}7$, 29, 31, $3\dot{3}$, $\dot{3}5$, 37,

$\dot{3}9$, 41, 43, $\dot{4}5$, 47, $\dot{4}9$.

By actually trying this method it will be seen how readily the composite numbers are marked out, and we may terminate the operation when our commencing number exceeds a third of the last number in the table.

Eratosthenes arrived at the age of eighty years, and ultimately becoming weary of life, died by voluntary starva- (Suidas, *Eratosthenes.*) Montucla, with his usual té, says, it would have been more philosophical to death 'de pied ferme.'

(Montucla, *Histoire des Math.*, p. 239; Delambre, *Hist de l'Astronomie Ancienne*, p. 86; Lalande, *Bibl. Astron.* in art.; *Sententiæ Gr. et Lat. in Poetis Min.*, *Radulphi Wintertoni*, Cambridge, 1700; *Fragmenta Gr. et Lat.*, by Shaubach, Göttingen; *Aratus*, Oxford ed., 1672; Horsley's *Tracts* and *Memoir* in *Phil. Trans.*, 1772; *Catasterismi*, Heyne; *Cribrum Arith.*, by L. Chernac; *Geographicorum Fragmenta*, 1787; Eutocius' *Commentary on Archimedes*. The last edition of the Fragments of Eratosthenes is by Bernhardy, Berlin, 1822, 8vo.: this edition does not contain the Catasterismi. See CLEOMEDES.)

ERBIL. [ARBELA.]

ERCILLA Y ZUÑIGA, ALONSO, the author of the 'Araucana,' an epic poem, mentioned with high praise by Hayley in his 'Essay on Epic Poetry,' and better known out of Spain than many other Spanish works of greater merit. Alonso was the third son of a celebrated lawyer, Fortun Garcia, lord of the castle of Ercilla, and was born at Madrid in 1533. His mother, Doña Leonor de Zuñiga, became a widow the following year, and being appointed *guarda damas* to the wife of Charles V., soon obtained for her son a place among the pages of the prince of Asturias, afterwards Philip II. At the age of fourteen, Ercilla probably had his genius awakened by attending that prince through Italy, Germany, and the Netherlands, in a pompous progress of which the chronicler of Philip II., Calvete de Estrella, has left an account, and in which he has vividly portrayed the manners and pageants of that fierce and romantic age. Following Philip in his subsequent travels, and on the occasion of his marriage with queen Mary, Ercilla came to England in 1554. While in London, he heard of a revolt of the brave Araucanians (Araucanos), against the Spaniards in Chile, and his military ardour being excited by the news, he volunteered to go to America in search of that glory which he soon acquired. It was amidst the incessant toils and dangers of a campaign against barbarians, under the canopy of heaven, with nothing to write on but small scraps of waste paper, and often only leather, struggling at once against enemies and surrounding circumstances, that, for the first time, an iron-clad poet

'Tomando ora la espada, ora la pluma,'

attempted to describe in epic strains the exploits in which he himself participated, and which he often directed. Thus did Ercilla write the first part of his 'Araucana,' so named from the war and country of Arauca, or of the *Auca* people, which means free. [ARAUCANIANS.] After numerous escapes from the dangers of the war, he was ordered to the scaffold (A.D. 1558) by a young and hasty commander, who thought he perceived a premeditated mutiny in a private quarrel which arose in the American city of Imperial, while the people were celebrating the accession of Philip II. to the crown. Ercilla, who on that occasion had to draw his sword in defence of his honour and life, was saved by the timely discovery of the injustice of the sentence which had been passed on him. Much impaired in health, although then only in his twenty-ninth year, the poet-soldier returned to Spain, but only to experience the continued neglect and disdain of that Philip whom he had served all his life, whom he had already invoked as his Augustus, and whom he celebrated in the sequel of his poem. To exalt and propitiate his reluctant patron, he introduced into it the episodes of the battles of St. Quentin and Lepanto. The indignity which he still experienced induced Ercilla to ramble for some time over different parts of Europe, where the only favour he received was from the emperor Rudolph, who appointed him gentleman of his bed-chamber. At last he settled at Madrid, where he lingered in retirement and penury, writing poetry till his death, the time of which is not ascertained. He was however alive in 1596, for Mosquera de Figueroa, in his 'Comentario de Disciplina Militar,' speaks of Ercilla as then engaged in celebrating the victories of Don Alvaro Bazan, marques de Santa Cruz, in a poem which was never published, and perhaps was left incomplete. The 'Parnaso Español' contains also a short erotic poem, written by Ercilla in his youth, and highly commended by Lope de Vega in his 'Laurel de Apolo.' But it is only the 'Araucana' which has recommended Ercilla to posterity. He published the first part alone; then the first and second parts together in 1577; and the whole three parts in 1590, many editions of which have appeared successively in different places. The severe censures passed on this poem by a host of biographers or compilers are ...

but only a long file of repetitions. Voltaire, who by his 'Essai sur la Poésie Épique,' has made the 'Araucana' more generally known, prefers the character of Colocolo in the second canto to that of Nestor in the Iliad. He shows, however, by his sweeping censure of the rest, and by his asserting that Ercilla was at the battle of St. Quentin, that he had not read so far as the seventeenth canto. The writer in the 'Biographie Universelle,' amidst some very fair and proper observations, and after placing the 'Araucana' much above the Henriade, mistakes the xxxvi. and xxxvii., or two last cantos, for its continuation, or the iv. and v. part of the 'Araucana' by Santisteban Osorio, a mistake which the most hasty glance at those cantos would have dispelled. The same writer is also unlucky in his correction of Voltaire, since the elaborate note about the possibility of Ercilla's having fought at St. Quentin confutes the anachronism of fixing his return from America in 1554, the precise year in which he sailed for America from London, as above stated. The other note by the same writer about Ercilla's birth proceeds from a misunderstanding of the biographical notice in the second volume of the 'Parnaso Español.'

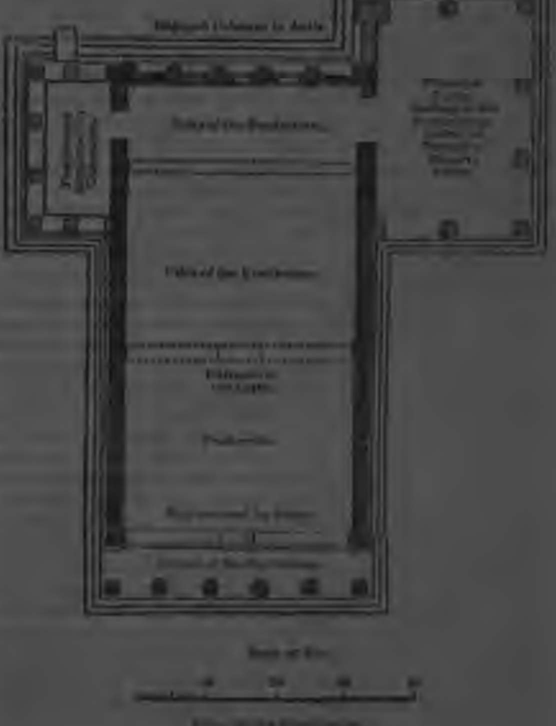
Bouterwek, after denying to the 'Araucana' the title even of a poem, bestows strongly sundry high but just commendations on its beauties, and thus revokes, in a great measure, if not totally, his hasty sentence of condemnation. The same writer, in supposing that Ercilla relates Dido's death after Virgil, shows that he had overlooked cantos xxxii. and xxxiii., where the heroine of Carthage is, on the contrary, amply vindicated, on the authority of Justin, from the misrepresentations of the Mantuan bard, who in the words of Ercilla shamefully

'[illegible]'

These inaccuracies in great authorities are noticed here in order to put readers on their guard against writers on literature in general; and our remarks on the errors of other critics must stand in the place of a criticism of our own on the poem, which within any reasonable limits would be impracticable. Nothing short of a sketch, however brief, of the 'Araucana,' could give a just idea of its plan and execution. It would however be unfair not to remind those who consider Ercilla as a second Lucan, that he undertook a much harder task than the Cordovan poet, who sung a mighty contest for the mastery of the world; while Ercilla had to contend against two features in his subject, the most unfavourable to an epic—a conquest not yet accomplished over a narrow, rocky, and unknown spot, and a brave and injured enemy struggling for their freedom. Still he succeeded in infusing an Homeric spirit into his long narration, which, independently of its other merits, is a real historical record.

ERECHTHEIUM, a beautiful Ionic temple dedicated to Erechtheus, built near the western brow of the Acropolis at Athens, and at the time when Stuart visited the place forming part of the modern fortress of the Acropolis. Connected with this building, and placed on one side of it at the end of the cella, is a tetrastyle pseudo-dipteral Ionic portico, in the same style as the portico of the Erechtheium; and on the opposite side is a small roofed building supported by caryatides, placed on an elevated basement. [CARYATIDES.] The back wall of the cella of the Temple of Erechtheus is decorated with four semi-columns in antis engaged in the wall, and of the same order as the portico, which is hexastyle, and raised on three steps, forming a basement which runs round the entire building with its adjuncts. In Stuart's 'Athens,' the prothyrum is restored, and forms a closed chamber, for which there does not appear to be sufficient authority. It is more probable that the prothyrum was open, like some other Greek temples, because, as shown on Stuart's plan, the portico from its shallowness would be of little use as a covering, and would also produce little architectural effect. In the side portico, called Minerva Polias, which was most probably constructed after the Erechtheium, there was no opportunity of producing a depth of shadow by the deep recess of an open prothyrum, and the architect accordingly appears to have adopted the pseudo-dipteral portico to produce a somewhat similar effect, as well as to gain a covered space for those who officiated. It would appear from the regularity of the plan of the Temple of Erechtheus that it was constructed before the other, and of that regular parallelogrammatic figure most commonly employed in those buildings; and that at a later period the Pandrosium was constructed, with the portico on the opposite side forming the entrance or vestibule to the cella of the temple, which was formed from a part of the cella of the Temple of Erechtheus, cut off from the end of that cella, which was either at that time or previously lighted with windows.

The length of the Temple of Erechtheus is 74 ft. 2 in., [illegible] from the columns of the portico to those at the back of the cella; the width is 36 ft. 6.07 in. The depth of the portico of Minerva Polias is 31 ft. 1.75 in., and the width 32 ft. 1.49 in. The Pandrosium is 18 ft. 4.10 in. wide, and 11 ft. 9.57 in. deep. (See Stuart's *Antiquities of Athens*, edited by W. Kinnard, architect.) The columns of the Erechtheium are 2 ft. 3.6 in. in diameter at the base, and 1 ft. 11.2 in. at the upper diameter; and those of the Minerva Polias 2 ft. 9.9 in., and the upper 2 ft. 4.5 in.; while the intercolumniations are respectively—Erechtheum 4 ft. 7.52 in.; Minerva Polias 7 ft. 2.10 in., although there is a slight variation in the intercolumns, which may be the effect of time and inaccuracy in setting them out originally. The columns of the Minerva Polias are on a much lower level than those of the Erechtheium. The capitals of the order of these two temples are very richly carved. If anything, the capitals of the Minerva Polias are a little richer than the Erechtheium. The volutes are very graceful [COLUMN], and the spiral lines are elaborately arranged. The angular volute is ingeniously contrived. The necking of the capital is enriched with leaves, as well as with an enriched ovolo and astragals, and the volutes are connected by an enriched twisted band or guilloche ornament. The shafts are fluted. But with regard to many peculiarities in the detail, we must refer to the plates in Stuart's 'Athens.' The entablatures have several of their members enriched, and are similar in design; the bases of the columns however vary. The height of the columns of the Erechtheium is 21 ft. 7.2 in., and of the Minerva Polias 25 ft. 0.05 in. The pilaster of the Erechtheium is elegantly decorated, and the mouldings and decorations are continued under the architrave. The height of the entablature of the Erechtheium is 4 ft. 11.2 in.; and the height of the Minerva Polias is 5 ft. 5.34 in. The rise in the pediment of the portico of the latter is 3 ft. 4.31 in. The entablature of the Pandrosium is heavy; it is decorated with dentils, and also with pateræ on the upper face of the architrave. The windows and doors diminish at the top, and the friezes of the porticos appear to have been formerly decorated, if we may judge from the remains of cramps and cramp-holes on their faces. Some details respecting this building, not published in Stuart, are



Plan of the Erechtheium.

given in the 'Erectheion,' a work on this edifice by H. W. Inwood, architect, who has imitated the Erectheium and Pandrosium in the external design of part of the New St. Pancrass Church, London. Stuart's Athens, vol. ii., contains the plans, elevations, sections, and details of this building.

ERE'TRIA. [EUBŒA.]

EREWASH. [TRENT.]

ERFURT, a province or administrative circle in Prussian Saxony, consisting of the former principalities of Erfurt, the former Imperial free towns of Mühlhausen and Nordhausen, the earldom of Hohnstein, together with the bailiwics of Langensalza and Weissensee, and several adjacent districts, as settled by the congress of Vienna. Its area is 1296 English square miles, and its population, which was 234,427 souls in 1816, and 285,874 in 1831, is at present estimated at about 298,000. About one fourth part of this population are Roman Catholics, and the remainder, with the exception of about 900 Jews, are Protestants. It is bounded on the north by Hanover and Brunswick, and on the south by Saxe Weimar, Gotha, and Schwarzburg, with the exception of the isolated districts of Henneberg, Neustadt, and parts of the Voigtland. The soil of this province is favourable for the cultivation of grain, and rather more than one half of its surface is arable land. About one-fifth of it is appropriated to meadows or pastures, and rather more than one-fourth is occupied by woods and forests. It is not watered by any streams of magnitude: the largest are the Unstrut, the Gera, Werra, Salza, Erlau, Heide, Wipper, and Saale. There are a number of mineral springs in the hilly districts. The stock of cattle in 1831 was as follows: horses 17,694, horned cattle 62,399, sheep 189,797, goats 13,242, and swine 31,909.

This province is divided into the nine circles of Erfurt, Nordhausen, Heiligenstadt, Mühlhausen, Worbis, Schleusingen, Langensalza, Weissensee, and Ziegenrück, and contains 1 fortress (Erfurt), 22 towns, among which are Erfurt, Heiligenstadt on the Leine, 3500 inhabitants, Langensalza, on the Salza, 6500; Tannstädt, on the Schambach, 3000; Mühlhausen, on the Unstrut, with ramparts and ditches, 11,000; Nordhausen, on the Zorge, at the southern extremity of the Harz mountains, 10,900; Benneckenstein, on the Harz, 3000; Ellrich, 2800; Bleichrode, on the Bode, 2500; Schleusingen, at the confluence of the Erlau and Nahe, 2660; Suhl, on the Aue or Lauter, 6500; Weissensee, on the Holbe, 2250; Gross-Sömmerdu, on the Unstrut, 2300; Worbis, near the source of the Wipper, 1600; and Ziegenrück, on the Saale, 820. The chief products of the province of Erfurt are grain, flax, safflower, tobacco, hops, oil, and salt; large flocks and herds of cattle and swine are reared; and in the circles of Weissensee and Schleusingen there are mines of iron, lead, and copper. Marble and gypsum, as well as sulphur, are also among its mineral productions. Erfurt is likewise distinguished for its manufactures of iron and steelware, tin plates, seed oil, woollen yarns, cloths, flannels, and carpets, linens, silks, cottons, stockings, paper, porcelain, glass, brandy, wooden clocks, &c. It has government establishments for the manufacture of gunpowder and fire-arms. There are mineral springs near Schleusingen and in other parts.

ERFURT, the capital of the minor circle of that name, as well as of the province, is situated on the Gera, a tributary of the Unstrut, in a richly cultivated plain in 50° 58′ N. lat., and 11° 3′ E. long. It was the antient capital of Thuringia, and is a fortress of the second order, possessing among its defences, which have been entirely renewed and much strengthened in recent times, two citadels, one the Petersburg, within the walls, and the other, Cyriaxburg, on Mount Cyriax, outside of the town. Erfurt, which has a number of gardens among its six suburbs, has six gates, five public squares, or open spaces, the largest of which is the market-place (with an obelisk of stone fifty feet high, erected by the citizens in 1802, to Charles, elector of Mentz, their then sovereign), several broad and well-built streets, and 19 churches, 11 being Roman Catholic, and 8 Protestant, of which the collegiate church of St. Mary is a fine Gothic structure: in this church there is a bell called the Maria Clara Susanna, cast in 1492, and weighing thirteen tons and upwards. There are 2 chapels, and there were several monasteries and convents, but all have been suppressed with the exception of the Ursuline nunnery, to which a female school is attached. In 1832 Erfurt contained 5 palaces, or princely residences, 73 buildings for government purposes, 47 manufacturing establishments, and 2748 dwelling-houses, with 22,000 inhabitants, exclusive of the military: in 1816 they amounted to 15,097, but in the sixteenth century they were not less than 58,000. About one fourth of the present population is of the Roman Catholic persuasion; the remainder, with the exception of about 200 Jews, are Protestants. What was once an Augustine monastery, where Luther resided from 1501 to 1508, in a cell which is still shown to visitors, is at present appropriated to the Lutheran Orphan Asylum. In this cell are a portrait of the reformer, his travelling pocket-case, and some of his books; and the following inscription stands over the doorway:—

'Cellula divino magnoque habitata Luthero
Salve, vix tanto cellula digna viro.'

The suppressed Scots' monastery contains the cabinet of physics, once the property of the university of Erfurt, which was founded in 1392, and closed in 1816. The scholastic institutions in the town are—a Lutheran high school, with which a seminary for teachers is connected, a Roman Catholic gymnasium, a mechanics' school, a deaf and dumb school, a school of surgery, another of design, and a third for arts and architecture, a Sunday-school for apprentices, and 16 schools of an inferior class. Among other institutions there are one of pharmacy and chemistry, a society of the useful arts, a botanical garden, a library of about 50,000 volumes, formerly belonging to the university, an ophthalmic and blind hospital, a general hospital, and a Bible society. Erfurt is the seat of provincial administration and of the provincial tribunals. It has considerable manufactures of cottons and woollens, besides less extensive ones of linens, ribbons, leather, soap, earthenware, meal, oil extracted from seed, stockings, gloves, tobacco, &c., and it carries on a brisk trade in fruits, seeds, grocery and drugs, grain, &c. It was, between the fourteenth and sixteenth centuries, the centre of the commercial intercourse between the north and south of Germany, and belonged to the Hanseatic league. At the foot of Mount Cyriax there are three mineral springs called the 'Dreibrunnen,' in the midst of shrubberies and gardens. Erfurt and the adjacent lands, to the extent of about 294 square miles, was a domain of the electors of Mentz from 1664 to 1802, when it was transferred to Prussia by way of indemnity for certain losses; in 1807 it was annexed to the French empire under the treaty of Tilsit; in 1808 it was the place of conference between Napoleon, the emperor of Russia, the kings of Saxony and Bavaria, and other sovereign princes; and in 1815 the congress of Vienna restored it to the crown of Prussia.

ERGOT, a name bestowed upon a peculiar state of the seed of several cereal grains, but most frequently of the rye, which resembles a spur, or horn; hence, likewise, termed *secale cornutum*, or *spurred* rye. Whether this state of the grain be merely an altered condition of the pistil, or the result of the puncture of insects, or of the development of a fungus, is doubtful; but the best authorities incline to the opinion that it is a fungus. This last view is rendered probable by the investigations of Wiggers, who found by analysis that the basis of the structure of the spur is almost identical in chemical properties with the principle called *fungin*, and that the white dust sometimes found on the surface of the spurs will produce it in any plant, if sprinkled in the soil at its roots, and therefore appears to be analogous to the sporidia or spawn of the admitted fungi. (See Mr. Bauer's paper on the *Uredo fœtida*, *Supplement to Penny Magazine*, March, 1833.) De Candolle considers the fungus to be the *Sclerotium clavus*. The spur is of variable length, from a few lines to two inches, and is from two to four lines in thickness; when large, only a few grains in each ear are affected; when small, in general, all of them are diseased. In colour the exterior or husk is of a bluish-black or violet hue, with two or three streaks of dotted gray; the interior is of a dull whitish or gray tint. It is specifically lighter than water, which affords a criterion for distinguishing sound from tainted grain. When fresh it is tough and flexible, but brittle and easily pulverized when dry. The powder is apt to attract moisture, which impairs its properties. Time also completely dissipates its peculiar qualities. 'It has a disagreeable heavy smell (which, being analogous to that of many fungi, strengthens the opinion that it belongs to that class of vegetable substances), a nauseous, slightly acrid taste, and imparts both its taste and smell to water and alcohol. Bread which contains it is defective in firmness, liable to become moist, and cracks and crumbles soon after being taken from the briar.' The most recent chemical analysis is that of Wiggers, who found it to contain a heavy-smelling fixed oil, fungin, albumen, osmazome, waxy matter, and an extractive substance of a strong peculiar taste and smell, in which, from experiments on animals, he was led to infer that its active properties reside. To this he gave the name of *ergotine*. Dr. Christison found Wiggers's statements to be correct in most points, except that what he procured as ergotine was destitute of marked taste or smell. Willdenow is of opinion that there are two varieties of the spur, and that only one of them is possessed of active properties.

Spurred rye occurs more frequently in some countries and districts than in others, and more abundantly in some seasons than in others. Rye raised in poor soil, and in a humid close air, such as that of the district of Sologne in France, is most liable to be infected; but, according to the experiments of Willdenow, it may be brought on at any time, by sowing the rye in a rich damp soil, and watering the plants freely in warm weather. A very rainy season, such as was that of 1816, is apt to produce it.

Bread prepared from grain which has a large admixture of the spur, occasions very distressing and often fatal effects, which are shown more or less rapidly according to the quantity present in the food, and the circumstances in which those who use it are placed. They have been observed to be most severe in seasons of scarcity, when various causes concur to produce disease. The symptoms which result from spurred grain, when used for a considerable time, are of two distinct kinds; one of a nervous nature characterized by violent spasmodic convulsions, the other a disordered state of the constitution, which terminates in the peculiar disease called gangrene ustilaginea, or dry gangrene. A single dose of the spur, not diluted by admixture with sound flour, excites effects which vary according to the quantity taken and the state of the person, and are chiefly limited to the stomach and intestinal canal, if the dose be small; but if so much as two drachms be taken, it causes giddiness, headache, flushed face, pain and spasms in the stomach, nausea and vomiting, with colic, purging, and a sense of weariness and weight in the limbs. In the case of parturient females, when given at a certain stage of the labour, it is admitted by most practitioners and writers to produce specific effects, and to expedite the labour in a very marked manner. It is by some persons alleged to produce hurtful effects upon the child; but such consequences probably occur only when it has been used at an improper stage of the labour, or when it ought not to have been employed under any circumstances. The rules for its employment are given in works devoted to obstetrics, to which we refer. It has likewise been recommended in menorrhagia and in leucorrhœa, but its utility rests upon less decisive evidence than in the case already stated.

The nervous symptoms arising from the use of bread formed of spurred rye may in general be cured by emetics, laxatives, and frequent small doses of opium, provided this treatment be adopted in reasonable time, and the unwholesome food completely withdrawn.

The tendency to dry gangrene is to be combated by the use of cinchona and cordials, with local applications to the part threatened. The noxious food must be completely relinquished. (Christison on *Poisons*.)

ERGOT, botanically considered, is a fungus belonging to the Gymnomycetous division, and constituting one of two species of Spermœdia admitted by Fries. He calls it *S. clavus*, and separates it from the genus *Sclerotium*, to which it had previously been referred, on account of its growing in the inside of other plants, and having no proper fructification. He defines the genus *Spermœdia* as follows: 'Variable, rounded, entophytal, rootless, of a fleshy mealy homogeneous texture, with a rind concrete, scaly, or somewhat pruinose. Proper fructification none.' And then he adds 'that it is only a morbid condition of the grain of corn, not propagated by seed, but generated by a particular combination of external influences (*cosmicis momentis*).' Endlicher takes the same view of the nature of ergot, only with more consistency he does not admit it as a real fungus, but only enumerates it as a diseased state of the seed of grasses, swelling into a fungoid body, and covered externally with powder. The same opinion is also very generally entertained. Nevertheless, we regard the question as being far from settled. The definite form assumed by ergot is unfavourable to the idea of its being a mere disease; the powdery efflorescence proceeding from its surface requires to be more particularly examined; and the microscopical anatomy of the production in different states must be far more exactly studied than it has yet been before the true nature of ergot can be positively determined. De Candolle is clearly of opinion that it is a peculiar fungus which attacks the ovary of grasses, destroying them when young, and protruding from them in a lengthened form, in rye and other European grasses; and Fontana asserts that it may be propagated by contact; the latter statement has however been contradicted.

The ergot of rye is not confined to that kind of grass, but attacks many other species. Fries distinguishes it by the lengthened form and white interior from Spermœdia Paspali, a Carolina ergot, which is globose and somewhat compressed, scaly and rough externally, pale brown and yellowish inside. A third species, not yet registered by botanists, attacks Indian corn in Columbia, and has a pear-shaped figure.

ERGYNE. [Isopoda.]

ERI'CA, one of the most extensive and beautiful genera known in the vegetable kingdom, belonging to the natural order that bears its name [Ericaceæ], and therein distinguished by its calyx being four-leaved, its corolla four-toothed, and its fruit a dry, four or eight-celled, many-seeded capsule, opening into valves with the dissepiments projecting from their middle.

Under this character is included a great variety of species having very narrow linear leaves arranged in whorls, and so little different in their vegetation in most cases, that when out of flower they are often not easily distinguished from each other; but exhibiting a surprising diversity in their flowers, in which their great beauty resides. The richness of colour, the elegance and variety of form, the delicacy of texture, or the minute microscopic perfection of their corolla, are such as no words can describe. Lovely as even our wild moorland heaths are, they rank among the lowest in point of beauty in this extraordinary genus, in which all the hues of red, pink, and purple, vie with each other in the most brilliant manner, assuming every tint but blue, and fading into the purest and most transparent white. Some of the species have the corolla as much as two inches long, in others it is not bigger than a pepper-corn; in some it is long and slender, in others inflated like a flask, or dilated like a vase of the purest form, or as round as an air bubble; and there are many in which it is split almost to its base, and immersed in a calyx whose texture and colours are even more brilliant than its own. Here we have a species the surface of whose corolla rivals in evenness and polish the finest porcelain; there another appears covered all over with hairs, exuding a glutinous secretion, which glitters upon its sides like solid crystals; and some again have their colours so dimmed by a loose shaggy coat, that their real tint can hardly be ascertained. There are even some in which the corolla assumes the very colour of the leaves, only clearer, brighter, and richer. This great difference in the structure of the flowers of different species is accompanied by distinctions in their anthers, which are either *muticous* (destitute of appendages), *cristate* (furnished with two little broad projecting membranes), or *aristate* (that is having a couple of bristle-shaped processes proceeding from their base). It has lately been proposed to take advantage of these and similar differences for breaking up the genus Erica, now consisting of between 200 and 400 supposed species, into a number of new genera; and accordingly in Don's 'General System of Gardening and Botany,' we find no fewer than twenty new groups formed at the expense of Erica. There can however be no reasonable doubt of this having been an injudicious measure, and that the greater part of these new genera are little better than fresh contributions to the confusion that already reigns in the nomenclature of garden plants. Dr. Klotzsch in particular, the present conservator of the Royal Herbarium at Berlin, by whom the order Ericaceæ has been made a subject of special study, objects to them in unmeasured terms; and it must be admitted that he possesses a much more correct acquaintance with Erica than any other author. For his views concerning the real importance of the differences observable in the organization of heaths, and the commencement of his still unfinished but very careful revision and reconstruction of the genus, the reader is referred to the 'Linnæa,' vol. ix., p. 612. The best arrangement in any work published in this country is to be found in the second edition of the 'Hortus Kewensis:' an enumeration with brief characters of 294 species, illustrated with a considerable number of good wood-cuts, is published in Loudon's 'Encyclopædia of Plants;' the 'Botanical Cabinet,' 'Botanical Repository,' and 'Botanical Magazine,' contain coloured figures of numerous species; and there are separate works upon the subject, also with coloured plates, one by Mr. Andrews, and the other by the gardener to the duke of Bedford.

The genus is confined to the old world. A few species occur in the north of Europe, and others in the countries bordering on the Mediterranean. In Great Britain, heather (Erica or Calluna vulgaris) covers large tracts of waste land and is used to thatch houses, to make brooms, and even beds, in the northern parts of the island. There is a double variety of this species which is extremely beautiful. All our British heaths are improved by cultivation, and are general favourites where the climate and soil are suited to them. They will not however thrive in hot dry places and in any common soil, but require sandy peat earth, and a situation where they are moderately shaded from the sun. Erica carnea, one of the few plants whose flowers bid defiance to the rigour of winter, and appear as the earliest harbingers of spring, is found wild in Germany and generally on the mountains of middle Europe. E. Australis, arborea, Mediterranea, and codonodes, adorn the rocks of the south of Europe.

But it is at the Cape of Good Hope that the principal part of the species is found; indeed the whole of those which are cultivated in greenhouses. In their native country they are by no means so handsome as when cultivated, but form scraggy shrubby bushes, with so little beauty, that the colonist boors have not vouchsafed to give them even a name.

On account of the great beauty of Cape heaths and the property which so few plants possess in common with them of producing their blossoms the whole year round, they have become universal favourites with all those who have a greenhouse at command. But an impression that there is great difficulty in cultivating them, and in fact the want of success that often attends their management, has deterred so many from attempting to grow them, and thus has robbed our gardens to such a degree of their very greatest exotic ornament, that we shall take this opportunity of stating at some length what precautions are really requisite in cultivating heaths, and of pointing out to what causes failure is generally to be attributed. We are the more induced to do so because the taste for this tribe of plants is reviving in this country, and because the supposed difficulty of keeping them in health has no foundation; for with a little care, and less expense than is required to grow pelargoniums, they may be brought to the highest state of perfection.

No man has ever given such excellent practical directions for the whole management of heaths from their first stage of a seedling or a cutting to their last of a noble full grown bush, as Mr. M'Nab of Edinburgh, of whose experience we of course avail ourselves in the succeeding statement; referring our readers to it for further information as one of the very best practical horticultural papers in any language. (*Treatise on the Propagation, Cultivation, and general Treatment of Cape Heaths*, by Wm. M'Nab, Edinburgh, 1832.)

If new varieties are wanted, the only way is to raise them from seed, but when this is not the object, by far the best method of propagating is from cuttings. Much of the success which attends the striking of cuttings depends upon the state they are in when taken from the plant; for example, if they are too young they are liable to damp off, and on the other hand, if they are too old, they do not emit roots freely; therefore the best is a middle course, which is not liable to either of these objections.

The leaves of the cutting must be stript off to about one-half of its length, and its end cut with a sharp knife: in this state it is fit for the cutting-pot. In preparing the pot, it is necessary to be particular about the draining, and for that purpose it should be filled to within about two inches of its top with broken pots, rough ashes, or something of this description; the remainder must be filled with sand, which should be procured as free from ferruginous matter as possible. Between the sand and draining, it is a good plan to have a thin layer of decayed turf or rough peat soil, otherwise the water will carry down the particles of sand, and render the drainage of little or no use.

Some cultivators press the sand very hard, water it well and then put in the cuttings; others do not press it at all, nor give it any water until the cuttings are introduced; the last method is perhaps the best, at least the intended effect is best produced by it; for while the water which is given afterwards, in the former case renders the cuttings more loose, in the latter they always become more firm; and it will be found, that those which have not been pressed at all, in a few days will be more firmly fixed than those which have been treated in a different manner.

Bell-glasses are frequently put over heath cuttings, but these are in most cases unnecessary, unless where the cuttings are exposed to a current of air, and where evaporation goes on rapidly. If bell-glasses are used at all, it is of the greatest importance to look over and wipe them occasionally, otherwise the moisture which is deposited upon the glass will prove very injurious to the young cuttings.

Heaths may be propagated at any season of the year when the young wood can be obtained in a firm but not hardened state, but the spring is the best time for performing this operation, because the young plants get rooted before the commencement of the dull and damp winter season, in which heaths are apt to suffer, if injudiciously treated.

If it is winter when the cuttings are put in they will require a little artificial heat, and may be placed in a stove; but, if in the end of spring or summer when the weather is warm, a cool greenhouse or frame is quite sufficient to insure their growth.

After the cuttings are sufficiently well rooted, which easily known by their beginning to grow freely, they must then be potted off, in pots of the smallest size, and regularly shifted into larger as they require it.

With regard to the soil in which it is most advisable to grow them, as very different statements are to be found in books, we quote Mr. M'Nab's words.

'The soil,' he says, 'for the first potting should be one half peat and one half sand, always taking care to drain the pots well with small pieces of broken pots or cinders. 'The soil for the second potting should be about two-thirds peat and one-third sand, and in all the after-pottings the soil should be the same as will hereafter be recommended.'

In the same part of his work he says, 'The soil which I have found Cape heaths thrive best in is a black peat soil taken from a dry heath or common which is never overflowed with water. In general it should not be taken off more than five or six inches deep. This, however, must partly depend upon the subsoil: for, in some cases, I have seen at twelve or fourteen inches deep the soil quite as good as at the surface. Whatever heath or other vegetable production is on the surface, should be taken along with the peat earth to the compost ground, and there laid up in a heap till wanted. It frequently happens that peat earth taken from such situations as I have mentioned has sand intermixed with it in its original state; but when this is not the case a quantity of coarse white sand should be procured and mixed with the earth in the compost ground. This should be at least to the extent of one-fourth or one-fifth of the whole, and although a little excess of sand is used, it will never be found injurious to the health of the plant.'

Mr. M'Nab, in shifting his heaths, has always at hand some fragments of soft freestone, which he introduces amongst the soil around the ball of the plant; the size of these stones is regulated by the width of the pots or tubs into which they are put. His reason for introducing stone shows how free his mode of cultivation is from quackery, and that he recommends nothing for adoption for which a sound physiological reason cannot be assigned.

'When stones are introduced among the earth in the way I have recommended, heaths will never suffer so much the summer from occasional neglect to water them as they would do if the stones were not introduced; because the stones retain the moisture longer than the earth, and winter they allow a freer circulation through the mass any superabundant moisture which may be given.'

The same successful cultivator recommends the plants be raised a little higher in the pot at each shifting than they were before; and after several shiftings the old ball around the stem will be raised two or three inches above the level of the edge of the pot or tub; always taking care, however, to leave sufficient room to hold enough of w between the base of the cone of earth and the rim of the pot.

This is an excellent plan, and one which cannot be too highly recommended, for there is scarcely a chance of the plant suffering from too much water being given it, even in winter; and if by chance it should receive too much, it can only be round the sides of the pot or tub, and at the extremity of the roots, whence it is carried off by the pressure of draining below. Moreover, and this is a most essential point, the water percolating through the earth next the sides of the pot ensures the tips of the roots being always kept damp and cool, a precaution absolutely indispensable in preserving heaths alive. It will generally be found that the sudden death so common among these plants is owing to the sides of the pot having become accidentally dried and heated. On this account a low pit, in which the pots can be so arranged that their sides are always in the shade, will be found a convenient place to grow them in during summer.

By treating Cape heaths in this way, they may be brought to a state of perfection quite unknown in their native country. From a list of some of the larger specimens grown in the Royal Botanic Garden, Edinburgh, it appears that they have attained the height of six, seven, and eight feet, and from ten to twenty-six feet in circumference. (*Arboretum et Fruticetum Britannicum*.)

The degree of cold which these plants will bear without injury is much greater than is generally imagined; at the same time experience shows that some are far more hardy than others. We learn from Mr. M'Nab that 'many of them will be much injured when the thermometer (Fahrenheit) falls eight or ten degrees below freezing; many others will require ten or twelve degrees below freezing to produce the same effect.' 'On the 20th of January, 1820, we had twenty-nine species of heaths planted out, which remained without injury till the 21st and 22nd of January the same season. The thermometer then fell fourteen degrees one night, and seventeen degrees the other below the freezing point, when they were all totally destroyed. The frost before had never been more than nine degrees below freezing.'

As the means of cultivating these beautiful plants are extremely different in different places, the following lists will be found useful to those who are only able to give a few of them room in their collections. They are borrowed from Mr. M'Nab, and therefore may be implicitly relied upon.

1. List of Cape heaths which will stand in the open air in autumn or middle of winter without protection, with the thermometer seven or eight degrees below freezing, without suffering in any way from such a degree of cold:—

Erica acuminata
aggregata
campanulata
cerinthoides superba
carnea alba
ciliaris
congesta
cordifolia
cruenta
—— superba
curviflora
depressa
Ewerana pilosa
expansa
exsudans
exsurgens
flexuosa
glabella
glomerata
gracilis
grandiflora
hispidula
hyacinthoides
incarnata
intertexta
lasciflora

Erica longiflora
longipedunculata
lucida
mammosa
margaritacea
montana
nigrita
pendula
perlata
physodes
pubescens minor
ramentacea
rosea
serpyllifolia
Sebana
Sparmannia
splendens
tenella
tenuiflora
tetragona
transparens
triflora
ventricosa
viridescens
verticillata

2. Heaths which are tenderer than those mentioned in the preceding list, and which when exposed to the same degree of cold, will be injured by it, but will not suffer although fully exposed to a temperature four or five degrees below freezing:—

Erica abietina
albens
articularis
aurantia
baccans
barbata
Blaeria
Bonplandia
cafra
calycina
cerinthoides major
coccinea rubra
colorans
concinna
Coventryana
cubica minor
cylindrica
daphnaeflora
densa
depressa
discolor
divaricata
elata
Ewerana
gelida
halicacaba
incarnata
Linnaeana

Erica Linnaeana superba
Linnaeoides
mucosa
multiflora
mundula
pellucida
persoluta
perspicua
praegnans
propendens
pubescens major
quadriflora
radiata
reflexa rosea
rubens
Sebana
—— aurantiaca
simpliciflora
sessiliflora
spicata
spuria
triceps
trivialis
tubiflora
urceolaris
vestita rosea
vestita

3. A list of the most ornamental heaths which will flower in succession at all times of the year.

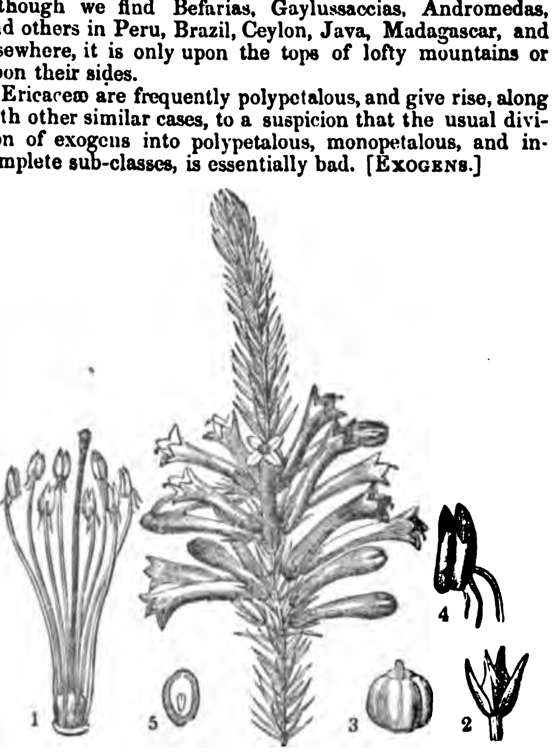
	Time of flowering.		Time of flowering.
Erica abietina	Sept.—Mar.	Erica melastoma	April—July
acuminata	Mar.—June	metulaeflora	April—Sep.
aitoniana	June—Oct.	Massoniana	Oct.—May
ampullacea	June—Aug.	mundula	Mar.—July
andromedaeflora	Apr.—June	mucronata	Apr.—Aug.
ardens	Apr.—June	mutabilis	all the year
aristata	May—July	nigrita	Mar.—Aug.
Blandfordiana	Mar.—June	odorata	Apr.—July
Bonplandia	Apr.—June	Parmentieriana	June—Aug.
Bowieana	Mar.—Sept.	Pattersonia	Mar.—July
brunnades	Apr.—Aug.	perspicua	May—Aug.
bucciniformis	May—Aug.	picta	Mar.—June
carneola	May—Aug.	praegnans	May—July
cerinthoides	Sep.—June	primuloides	May—July
Cliffordiana	Sept.—Feb.	princeps	Apr.—July
colorans	Oct.—June	propendens	May—July
Coventryana	Mar.—June	pubescens	Mar.—Nov.
cubica	Apr.—July	pyramidalis	Feb.—May
Cussonia	Jan.—Mar.	quadriflora	Mar.—Aug.
depressa	Jan.—Aug.	radiata	May—Aug.
echiiflora	Apr.—June	reflexa	May—Oct.
Ewerana	July—Aug.	resinosa	Feb.—Aug.
elegans	Apr.—July	retorta	July—Aug.
exsurgens	Aug.—Nov.	Savillea	July—Aug.
expansa	Mar.—July	scabriuscula	May—July
exima	June—Aug.	Sebana	Mar.—June
florida	May—Aug.	Shannoniana	July—Sept.
fascicularis	Feb.—May	Solandra	all the year
glauca	May—July	spuria	May—Aug.
gracilis	Mar.—June	sulphurea	Mar.—June
grandiflora	May—Sept.	taxifolia	June—Dec.
grandinosa	May—Sept.	Templea	May—Aug.
hyacinthoides	June—Aug.	Thunbergia	June—Aug.
inflata	June—Sep.	togata	June—Aug.
Irbyana	July—Sept.	tricolor	June—Sep.
jasminiflora	July—Oct.	tubiflora	April—July
Kalmiflora	Aug.—Feb.	tumida	July—Sept.
Lambertiana	Aug.—Apr.	ventricosa	June—Sep.
Linnaeana	Jan.—May	ventricosa coccinea	. .
—— superba	Mar.—May	stelliflora	. .
Linnaeoides	Nov.—May	carnea	. .
magnifica	June—Nov.	alba	. .
[illegible]	Sept.—Mar.	superba	. .
		erecta	. .
		verticillata	Sept.—Mar.
		vestita coccinea	Apr.—Nov.
		alba	— —
		purpurea	— —

Those who have not tne convenience of a green-house or heath-house to grow Cape heaths in may nevertheless form beautiful clumps in their flower gardens by a judicious selection of hardy sorts (some of which have been already named), and by attending to the principles which have been laid down, namely, draining the ground, removing the soil where it is not suitable for their growth, and filling the space with a mixture of peat soil and sand, and at the same time introducing a quantity of freestone to equalize the moisture of the soil.

ERICA'CEÆ, a natural order of exogens, deriving their name from the extensive genus that forms the subject of the last article. It is readily known from all other orders by its anthers bursting by pores at their apex, the stamens being hypogynous, the corolla monopetalous, and the ovary containing more cells than two. By this character are combined with the genus Erica the fragrant richly-coloured Azalea, the shady evergreen Rhododendron, and the delicate irritable Kalmia, together with Arbutus, Andromedas, Gaultherias, and many others equally beautiful; in fact it is probable that if it were necessary for a botanist to name some one natural order as pre-eminent for beauty, this would be the one selected. It is therefore not a little curious that it should also be an order of poisonous plants; for one would hardly expect danger to lurk beneath forms so fair. Nevertheless Rhododendron ponticum, Azalea pontica, and various Kalmias and Andromedas are notoriously deleterious, and even the Arbutus berries are in no inconsiderable degree narcotic.

The order is unknown in very hot countries, except at considerable elevations; it appears generally to love exposed situations, and, with the exception of Erica itself, to follow mountain chains, as it advances from the cool plains of the temperate zone to equinoctial regions. Hence, although we find Befarias, Gaylussaccias, Andromedas, and others in Peru, Brazil, Ceylon, Java, Madagascar, and elsewhere, it is only upon the tops of lofty mountains or upon their sides.

Ericaceæ are frequently polypetalous, and give rise, along with other similar cases, to a suspicion that the usual division of exogens into polypetalous, monopetalous, and incomplete sub-classes, is essentially bad. [EXOGENS.]



Erica longiflora.

1, Stamens and pistil; 2, calyx; 3, ovary; 4, anther; 5, section of seed, showing the embryo.

ERICHTHUS, Latreille's name for a genus of deep-sea crustaceans, and placed by M. Milne Edwards between the genera *Squillerichthus* and *Alima*. The last-named author makes the tribe Erichthians (*Erichthiens*) belong to the family of Unicuirassiated Stomapods (*Stomapodes Unicuirassés*), the general characters of the tribe being an undivided carapace and a styliform rostrum; no moveable rostral plate; and branchiæ, in general, rudimentary.

The tribe, according to M. Milne Edwards, is composed of a certain number of small crustaceans approximating to the *Squillæ*, but which have in general only rudimentary branchiæ, and are often completely deprived of them. They are easily distinguished by their carapace, which is large, lamellar, generally transparent, without longitudinal furrows or distinct lobes, and always armed with a styliform rostrum, which advances above the ophthalmic and antennular rings. These two first rings of the head are less distinct than they are in *Squilla*, but have very nearly the same conformation, and move upon the succeeding cephalic segment. The *Internal antennæ* are inserted below and behind the ocular peduncles; they are rather distant from each other, and their slender and cylindrical peduncles are composed of three joints, and carry at their extremity three multiarticulate filaments. The *External antennæ* are inserted at some distance behind the preceding, and are directed outwards; their peduncle is large and formed of two joints, of which the first gives origin, by the anterior border of its extremity, to a slender and short stem (tige), composed of two peduncular joints and a multiarticulate filament, the second carrying at its extremity a large oval-shaped blade or lamina with ciliated edges. The *Epistoma* is not projecting and swollen as in *Squilla*, and the mouth resembles a pear-shaped tubercle, situated near the middle or towards the posterior third of the lower surface of the carapace. The *Upper Lip* has the form of a triangle, with a rounded base which is directed backwards. The *Mandibles* are vertical, swollen at their base, and armed with two branches with dentilated borders, the upper of which raises itself into the interior of the pharynx; their palpiform stem (tige) is either rudimentary or null. The *Lower Lip* is large and composed of two swollen lobes. The *Jaws* are small and of the same conformation as those of *Squilla*, excepting that those of the second pair are narrower. The members which represent the anterior jaw-feet, the prehensile feet (*pates ravisseuses*), the three pairs of subcheliform feet applied against the mouth, and the three pairs of natatory feet, which terminate the series of thoracic members, are formed and disposed in the same manner as they are in *Squilla*. It is only to be remarked that often the three pairs of subcheliform feet are less approximated to the mouth than they are in the *Squillæ*, and that those of the three last pairs are sometimes rudimentary. The *carapace* is prolonged more or less far beyond the last rings of the thorax, or even beyond the first segments of the abdomen, but without adhering thereto. The abdomen is elongated; its last segment is very large, and entirely covers the appendages of the preceding ring, which are short, but formed like those of the *Squillæ*. Finally, the false feet suspended from the five first rings of the abdomen are more slender and more elongated than in the other division of the family, and, as has already been noticed, present in general only the vestiges of branchiæ.

Geographical Distribution.—The *Erichthians* have as yet occurred hardly any where else tnan in the ocean (haute mer), and have hitherto been found only in tropical regions.

Genera: Squillerichthus.

Carapace armed with spiniform prolongations and covering the base of the internal antennæ, but posteriorly it does not overpass (not comprising the spines) the last ring of the thorax. The rostrum is styliform and very long. The eyes are large, pear-shaped, and articulated on a very slender and rather long cylindrical peduncle. The ophthalmic ring is not distinct from the antennular ring, as in the *Squillidæ*, but the mode of insertion of the antennæ is the same as in those animals and in the *Erichthi*. The *antennæ* of the first pair are directed forwards, and present nothing remarkable. The external antennæ are directed outwards, as in the *Erichthi*, and present also a large peduncle, carrying at its extremity a large oval-shaped lamina ciliated all round, and giving insertion, by its anterior border, to a very short stemlet (tigelle), composed of two peduncular joints and a terminal filament. The *mouth* is little distant from the base of the antennæ, and situated towards the middle of the carapace. The *upper lip* is large, demicircular, and projecting. The *mandibles* are directed downwards as in the *Squillæ*, and there is a large denticulated tooth and a prolongation equally dentilated on its edge, which mounts towards the stomach; but the palpiform stem is null or rudimentary. Behind the mandibles are found a large inferior bilobated lip; and then two pairs of *jaws*, the form of which is the same as in the *Squillidæ*. The appendages that correspond to the *jaw-feet* of the first pair present nothing remarkable; they have the form of a long and slender stem, and, as in the other crustaceans of this family, do not seem to form a part of the buccal apparatus. The members of the following pair are very large and constitute *prehensile feet* (pattes ravisseuses), exactly similar to those of the *Squillæ*; their penultimate articulation is enlarged and spinous towards the base, and their terminal claw is short and armed with spiniform teeth on the prehensile edge. The feet of the three following pairs are inserted on a transverse curved line immediately behind the prehensile feet, and are habitually applied against the mouth, exactly as in the *Squillidæ*; each of these carries at its base a flattened disk-like vesicle, and is terminated by an oval cheliferous *manus*. The three last thoracic rings are complete, and free below the carapace, which covers the two first. The three pairs of corresponding feet are of moderate size, and formed as they are in the *Squillidæ*, only their last joint is not setiform. The abdomen is large, and much resembles that of the *Squillæ*, except that the last segment is much larger and habitually covers the members of the penultimate ring. These last organs are composed, as in the *Squillæ*, of a peduncular joint, which prolongs itself internally into a great lamina, and carries two appendages inserted on its edges near its base. The internal appendage consists of a great ciliated lamina, and the external one is composed of two joints, of which the last is oval, and the penultimate joint armed with spines on the external border. The *false feet* suspended from the five first rings of the abdomen are large and formed of a nearly square peduncular joint and of two great oval laminæ with ciliated edges; the internal lamina bears on its internal edge a small rudimentary appendage, and the external gives insertion, near its base, to a large ramose *branchia*.

Place in the series.—M. Milne Edwards, who founded this genus, and whose description we have above given, considers that *Squillerichthus* forms the passage between the *Squillæ* and the *Erichthi*.

Locality.—The form has only been found as yet in the Asiatic seas.

The species (two only are recorded) are small. Example, *Squillerichthus typus*.

Description.—Rostrum advancing beyond the peduncle of the internal antennæ; a great horizontal spine on the middle of the posterior border of the carapace; and, on each side, another and longer spiniform elongation, springing from the angle of the carapace; finally, a rather strong point towards the middle of the lateral border of the carapace, and another above the base of the external antennæ. Claws of the prehensile feet armed with four teeth (including the terminal point). The last thoracic ring is not covered with the carapace, and the abdomen is very large: the last segment is much longer than it is wide, and armed with three pair of marginal teeth. Length about 10 lines. Found in the seas of Asia. (Milne Edwards.) The other species recorded by M. Milne Edwards, *S. spinosus*, was taken by M. Duvaucel in the gulf of Bengal.

Erichthus

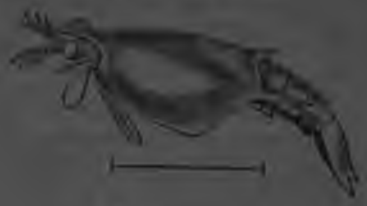
Carapace very large, convex, and armed with spiniform elongations. It entirely covers the base of the ocular peduncles, as well as of the antennæ, and extends backwards more or less far beyond and above the abdomen, which is short and large. The *eyes* are large, pear-shaped, and are not carried on a slender and elongated stem, as in the *Squillerichthi* and *Alimæ*. The *antennæ* present nothing remarkable, except that the stemlet (tigelle) of those of the second pair is often rudimentary, and that those of the first pair are rather short. The mouth is formed in the same manner as it is in the *Squillerichthi*, only the external jaws are extremely small and narrower. The *jaw-feet* of the first pair are extremely slender and of moderate length; they are slightly enlarged towards the extremity and have a rudimentary nail or claw at the end. The *prehensile feet* are but little developed; their claw is nearly straight and without denticulations, and the penultimate joint is slender, elongated, straight, and devoid of spines. The feet of the three following pairs are formed in the same manner as they are in *Squillerichthus*, but they are inserted one after the other; the flattened vesicle fixed at the base of each of these organs, as well as of the members of the two preceding pairs, is very large. The thoracic feet of the three last pairs are formed in the same manner as in *Squilla* and *Squillerichthus*, but are little developed, and sometimes want the styliform appendage; at other times they are entirely rudimentary, and are only composed of a small peduncle, terminated by two articulations, nearly like the false abdominal feet, but much smaller. The *abdomen* is wide and short; the caudal fin which terminates it is disposed as in *Squillerichthus*, and the false feet of the first pair are large and terminated by two great oval laminæ, on one of which is a rudimentary *branchia*.

M. Milne Edwards, who gives the above characters, divides the nine species into the following sections:—

α

Species whose rostrum is very long and passes sensibly beyond the internal antennæ.

Example, *Erichthus vitreus* (*Smerdis vulgaris*, Leach). Locality, the Southern Atlantic Ocean.



Erichthus vitreus.

β

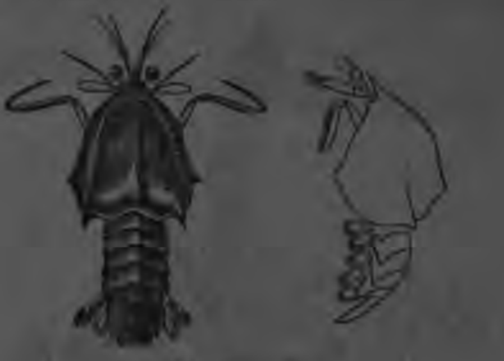
Species whose rostrum is of moderate length, and passes beyond the peduncle of the internal antennæ without attaining to the extremity of those appendages.

Example, *Erichthus armatus* (*Smerdis armata*, Leach). Locality, Coasts of Africa.

γ

Species having the rostrum extremely short (not passing beyond the peduncle of the internal antennæ).

Example, *Erichthus Duvaucellii*. Locality, Gulf of Bengal.



Erichthus Duvaucellii.

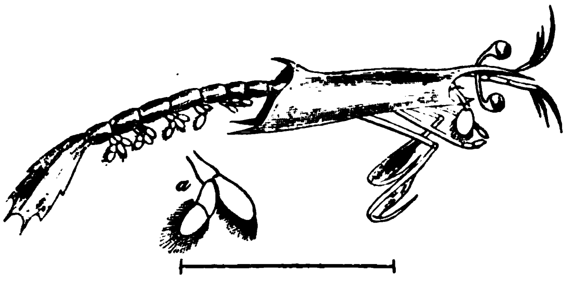
Alima

Carapace narrow, straight above, if not altogether so behind, where it often presents a sudden roof-like elevation; *rostrum* straight and styliform. The anterior angles of the carapace constitute two acute spines directed forwards; the posterior angles are also prolonged into the form of points directed backwards on each side of the abdomen. Finally, the lateral borders of the carapace are nearly straight. The ophthalmic and antennular rings are not hidden under the carapace as in *Erichthus*, but are seen uncovered under the rostrum. The *eyes* are carried on slender, long, cylindrical peduncles directed outwards. There is nothing particular about the *antennæ*. The *mouth* is situated very far from the front, towards the posterior third of the lower surface of the carapace; the *upper-lip*, the *mandibles*, the *lower-lip*, and the two pairs of *jaws* have the same form as in *Erichthus* and *Squillerichthus*. The thoracic *feet* are formed also in the same manner as in *Erichthus*, but the three pairs of members which follow the prehensile feet are more approximated to the mouth, as in the *Squillæ*. The posterior border of the carapace is ordinarily notched, so as to leave uncovered the two last thoracic rings, and the *abdomen* is narrow and elongated. The false feet are large, but are, in general, completely devoid of branchiæ: sometimes vestiges of these organs are found upon the abdominal members of the first pair, and at other times they are represented by a small pediculated tubercle fixed to the external blade of these appendages. Finally, the conformation of the species of caudal fin formed by the last abdominal segment and the false feet of the sixth ring are entirely the same as in *Erichthus*. M. Milne Edwards, whose description we have given, states that the *Alimæ* bear an extremely strong resemblance to the *Erichthi*, but always have the body more elongated. Their manners, he adds, are not known, and he divides the five species into the following sections:—

a

Species which have the hand of the prehensile feet unarmed with spines.

Example, *Alima hyalina* (Leach). Locality, Cape Verd.



Alima hyalina. *a*. Natatory ventral appendage magnified.

β

Species which have the hand of the prehensile feet armed with teeth or spines on the prehensile border.

Example, *Alima laticauda*. Locality, New Guinea. (Quoy and Gaimard.)

M. Milne Edwards observes that the species figured by M. Guerin under the name of *Alima triacanthura*, belongs to this division, and seems to be distinguished from the other species by the brevity of the rostrum, the shortness of the lateral blades of the caudal fin, &c.

Alima longirostris of the same naturalist has not, according to M. Edwards, been described, but seems to approach very nearly to the preceding species.

ERICHT, LOCH. [INVERNESS-SHIRE.]

ERICK, in Swedish, is synonymous with the German Heinrich, and the English Henry, and is the name of many kings of Sweden and of Denmark. Of the earlier kings of this name little is known, for the history of the Scandinavian nations previous to the ninth or tenth centuries of our æra is very confused. Messenius, in his 'Scandia Illustrata,' ridicules the accounts given by Johannes Magnus and other Swedish historians, who, he says, have striven to outdo the Danish chronicler, Saxo Grammaticus, in his fabulous legends. Another respectable authority, Puffendorf, expresses himself as follows: 'The names and deeds of the early kings of Sweden and the periods of their reigns cannot be easily determined, as the lists which have been published are by no means authenticated, and the traditions of those times have been derived chiefly from the antient songs and fabulous legends, or out of the allegorical traditions of the antient Scalds or poets, which have been perhaps wrongly interpreted.' (*Introduction to the History of Sweden.*) In the earlier centuries of our æra the country now called Sweden was divided into several kingdoms or states, of which Sweden Proper and Gothia were the two principal. Sweden Proper comprised the central part of present Sweden, and included the provinces of Upland, Sudermanland, Westmanland, Nerike, and part of Dalecarlia. The kingdom of Gothia comprised the southern part of the great Scandinavian peninsula, including the provinces of Ostrogothia and Westrogothia, divided by the Wetter Lake, Småland, Bohusland, Skane, and Blekingen, with the isles of Gothland and Oeland. But the most southern provinces, especially Skane, were for a long time a subject of contention with the Danes, who frequently occupied them.

There was also the kingdom of Wärmeland, north and west of the great Wener Lake, extending to the borders of Norway; and the kingdom of Halsingland, north of Sweden Proper, which included the provinces of Angermanland, Jämteland, East and West Bothnia, up to the wilderness of Lapland. Most of these provinces had each its separate chief or king, something like the earlier Saxon kingdoms in England; but the king of Sweden Proper, or of Upsal, as he was also called, was considered in ordinary times as the head of the whole, like the Bretwalda of the Saxon Heptarchy. Odin or Wodin, the conqueror of Scandinavia in the century previous to our æra, is said to have kept Sweden for himself, allowing his relatives or companions to settle in the rest of Scandinavia as his vassals; and the superiority of Sweden was acknowledged for several centuries after, so that at the great general meetings of the Scandinavian nations the king of Denmark used to hold the bridle and the king of Norway the stirrup of the king of Sweden's horse. (Puffendorf.)

Among the earlier kings of Sweden, in the fifth and sixth centuries, we find several Ericks, of whom little or nothing is known. One of these reigned together with his brother Alrick as kings of Upsal, from about A.D. 465 to A.D. [illegible] Another Erick and his brother Jorund, being the sons of Yngue Alrickson, were following the then common profession of sea-kings, or pirates, when a vacancy on the throne of Sweden, to which they had some family claim, recalled them home about A.D. 525. They were opposed by the usurper Haco, when Erick was killed, and Jorund was obliged to escape. In the ninth century we find Erick Biörnson reigning together with his father Biörn Järnsida about A.D. 864. Biörn died in 870, and Erick reigned alone till 874, when he died abroad in some expedition. He was succeeded by his son Biörn and his nephew Erick, the son of Refil the Sea King, who reigned together for a time. The two kings went with a host to join their Norman friends at the siege of Paris, A.D. 886, when Charles the Fat was obliged to conclude a dishonourable peace. Biörn appears to have died at the siege, and Erick Refilson returned home and died some years after. He was succeeded by Erick, son of the late Biörn, who reigned together with his brother Biörn, called of Höga, from the place of his residence. After his death Erick Emundson, a grandson of Erick Refilson, was proclaimed king about A.D. 910, under the guardianship of his great uncle Biörn of Höga. Biörn died in 925, and Erick remained sole king of Upsal. He sustained a war against Harald Harfager, king of Norway, and at his death was succeeded by his son, Biörn IV.

Erick Segersäll or 'the victorious' reigned from [illegible] 994. He retook Skane and Halland from the Danes, and at last drove away their king, Sweno, from Denmark itself. He also defeated the Norwegians and Finlanders, and conquered Livonia, Esthonia, and Courland. Erick was succeeded by his son Olaf, or Olaus, who is mentioned as the first Christian king of Sweden.

In the year 1155, after the death of Swerker Kolson, the Othogothians chose his son Charles for their king, but the Swedes at their general assembly at Upsal elected Erick Jadwardson, a nobleman connected by alliance with both the royal families of Sweden and Denmark. He is styled Erick IX. by most chronologists, and he is also called Erick the Pious, or St. Erick. After some demur the Goths agreed that he should reign over both kingdoms, but that after his death Charles Swerkerson should succeed him. Erick brought back the Halsingers and the Jämmtlanders to the Swedish allegiance. In 1157 he proceeded with troops to Finnland, in order to subdue the natives and convert them to the Christian faith, and the bishop of Upsal accompanied him on this expedition. The Finnlanders were defeated, many of them were slain, and the rest were baptized. Christian churches were founded by the bishop who remained in the country, while Erick returned to Sweden, where he employed himself in compiling a code of laws out of the antient constitutions of the kingdom. This compilation is known by the name of St. Erick's law. Erick is remembered in history as a good king. In 1161, on the 11th May, as he was in the neighbourhood of Upsal, a party of Danes who had landed on the coast under Prince Magnus, surprised and killed him after a brave defence on his part. Magnus had his head cut off, and afterwards proclaimed himself king; but the Swedes and Goths uniting under Charles Swerkerson fell upon the Danes and killed them all, together with their prince, and out of the spoil they built a church on the spot. Charles was then knowledged as king of the Swedes and the Goths, the title which the kings of Sweden bear to this day.

Charles was killed by Knut, St. Erick's son, about 1168, who succeeded him, but after Knut's death, A.D. 1192, the crown was again disputed between Erick Knutson and Swerker the son of Charles, who was supported by the Gothlanders. After a long war, Swerker was killed in battle A.D. 1210, and left Erick Knutson in quiet possession of the throne. St. Erick's convention was then renewed, and John, the son of Swerker, was constituted heir to the throne, which was afterwards to return to Erick's descendants. Erick died in 1216 at Wisingsoe, which was the usual place of residence of the Swedish kings in those days.

Erick Erickson, son of the preceding, succeeded John in 1222 according to the convention, and reigned till 1250. His reign was at first distracted by civil war. The powerful family of Folkungar, who were allied to the king by marriage, revolted against him; but they were defeated, and two of the leaders were put to death. Under this king Gulielmus Sabinensis, the Pope's Legate, first forbade marriage to the Swedish priests. Erick made war upon the Finnlanders, who had revolted, and built several fortresses on their frontiers. He died at Wisingsoe without issue, and was succeeded by Waldemar I., his sister's son.

Erick, son of king Magnus, and of Blanche, daughter of the Flemish Earl of Namur, was made colleague to his father by a powerful party of the nobility in 1344. A war broke out between father and son in 1357, and at last the kingdom was divided between them, Erick having the whole southern part, including Skane, East Gothia, Smaland, &c. Erick was shortly after poisoned at an interview with his father, and, it was reported, by the agency of his own mother.

Erick, styled XIII., Duke of Pomerania and nephew to Queen Margaret of Waldemar, who had united Sweden, Norway, and Denmark under her sceptre, was appointed by the General States of the three kingdoms assembled at Calmar in 1396 to be her successor. He married in 1406 Philippa, daughter of Henry IV. of England, and in 1412, after Margaret's death, he assumed the reins of government. But he soon gave proofs of incapacity, and his capricious and tyrannical sway disgusted the Swedes, to whom he preferred his Danish subjects. Becoming entangled in a tedious war with the Dukes of Holstein and Mecklenburg and the Hanse Towns, in order to carry it on he loaded his subjects with taxes, while their commerce was ruined. He violated the articles of the Calmar union, stripped Sweden of its archives, which he took with him to Denmark, and filled most military and civil offices in Sweden with Danes and other foreigners. The Dalecarlians were the first to revolt, being led by a nobleman of the name of Englebrecht. They were joined by the North Hallanders and others, and at last they obliged the senate of the kingdom assembled at Wadstena to renounce its allegiance to Erick. Erick made a hasty peace with the Hanse Towns, collected a fleet with troops on board, and sailed for Stockholm. After repeated attempts, he was obliged to make a convention with the insurgents, by which the king retained garrisons in the three castles of Stockholm, Calmar, and Nykoping; all other situations in the kingdom being filled by Swedish natives. At the same time he promised to respect the articles of the Calmar union, and returned to Denmark. But his bad faith kept alive the discontent, and in 1438 the leaders of the Swedes entered into secret negotiations with the chief men in Denmark, who were likewise dissatisfied with Erick, and a general revolt ensued. Erick had already withdrawn from Denmark into the island of Gothland with his treasures. The Danes chose for their king Christopher, Duke of Bavaria, king Erick's sister's son, and the Swedish Diet assembled at Arboga offered him likewise their crown under the stipulations of the Calmar union. Erick was allowed by Christopher to retain possession of the island of Gothland; but after Christopher's death in 1448 Charles Knutson, who succeeded to the throne of Sweden, besieged Erick in the town of Wisby. Erick escaped into Pomerania, with the assistance of Christian, king of Denmark, who sent him to the island of Rugen, where he ended his days. (Dalin's *Svea Rikes Historia*, Stockholm, 1747; Puffendorf's *Introduction to the History of Sweden*; and Geijer *Svea Rikes Häfder*, 1825.)

ERICK XIV. of Sweden, the son of Gustavus Vasa, was acknowledged, by a diet held at Westeraas in 1544, as heir to the throne, while he was in his eleventh year; he succeeded his father in 1560. He began by showing a considerable degree of jealousy towards his brothers John, Magnus, and Charles, whom their father had made dukes of Finnland, East Gothia, and Sudermannland, as feudatories of the crown. He was also engaged in war with the Liflanders or Livonians, who had placed themselves under the protection of Denmark and of Poland; but the Esthlanders remaining attached to Sweden, Erick sent an army to Revel for their protection, and successfully defended that place against the Poles. Erick had at one time, before he was king, asked the hand of Elizabeth of England, who gave no positive answer, and after his accession to the throne he embarked to pursue his addresses in person. A violent tempest however having driven him back to Sweden, Erick, who was superstitious and a believer in astrology, gave up all thoughts of the match, and turned his attentions to Mary, queen of Scotland, but with no better result. His brother John having married Catherine, daughter of Sigismund, king of Poland, without Erick's consent, Erick besieged him in the castle of Abo, made him prisoner, and kept him and his wife in close confinement, until the remonstrances of the people obliged him to release them. At the same time a war broke out between Denmark and Sweden, in which the Swedes had the advantage in several sea-fights. Meantime King Erick gave himself up entirely to his mistresses, and entrusted the care of the kingdom to his favourite Joran Peerson, an unprincipled man, by whose advice and that of Dionysius Burreus, a Frenchman by birth and his former tutor, he put to death several noblemen, among others the Stures, father and son, who belonged to a powerful Swedish family of Nils Sture; one of them was stabbed by the king with his own hand. Erick even went so far as to concert a scheme to put to death his brothers at a great festival to be given at Stockholm, but having been apprized of it, they conspired against him, seized upon several castles, collected a force, and marched upon the capital. Erick, after some defence, was obliged to surrender; the assembly of the states deposed him in 1568, and he was kept a close prisoner in the castle of Gripsholm, where he was treated very severely. His brother John was proclaimed king of Sweden. After nine years' confinement, Erick was put to death by poison, by order of his brother in 1577. (Celsius, *Konung Erick den Fjortondes Historia*, 1795.)

ERICK I. of Denmark reigned about the ninth century. He is commonly reckoned as the first Christian king of Denmark, and it was under his reign that Anagarius, bishop of Bremen, preached Christianity both in Denmark and in Sweden.

ERICK II. succeeded his brother Olaf or Olaus IV. about the year 1095. He made war in Pomerania, and took Julin, then a considerable town of that country. He greatly favoured the Christian religion, and obtained of the pope the establishment of the archbishopric of Lund in *Scania*, which then belonged to Denmark. Erick visited *Rome*, and died in the island of Cyprus about 1103, while on a pilgrimage to the Holy Land.

ERICK III., son of the preceding, made war against the Wendes or Vandals, who were carrying on piracy in the Baltic. He died about 1138, and was succeeded by

ERICK IV., his son, called 'the Lamb,' who turned monk at Odensee, in 1147.

ERICK V. succeeded his father Waldemar II. in 1241, and was murdered by his brother Abel, in 1250, who succeeded him on the throne.

ERICK VI. succeeded his father Christopher I. in 1259, was engaged in war against the king of Norway, and was involved in disputes with his own nobles, who, at a Diet held at Wyborg in 1282, obliged him to sign an act defining their privileges and the limits of the royal authority. He was taken prisoner in battle by Erick, duke of Holstein, and cruelly murdered in 1286.

ERICK VII. succeeded his father Erick VI., and continued the war against the king of Norway. He reigned till 1319, and was succeeded by his brother Christopher II.

ERICK VIII., styled by some VII., is the same as Erick XIII. of Sweden, the nephew and successor of Margaret of Waldemar. [ERICK XIII.]

ERI'DANUS. [Po.]

ERI'DANUS (the river Eridanus), a constellation first mentioned by Aratus, who calls it Eridanus. Hyginus states it to have been named from the Nile, and assigns a reason [Canopus]; but the scholiast on Aratus states this to have been peculiar to the Egyptians. In the heavens it is a winding stream, not very well marked by stars, extending from a bright star (α) of the first magnitude, called Achernes, and situated near the southern part of Phœnix, past the feet of Cetus, and ending at the star Rigel in Orion. Its principal stars are as follows:—

Character.	No. in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed. Piazzi (). Bradley [ ]. Lacaille C.	Astron. Society.			Flamsteed. Piazzi (). Bradley [ ]. Lacaille C.	Astron. Society.	
τ^1	1	297	4	ν	48	530	4
τ^2	2	311	4	(k^3)	49	532	5½
η	3	316	3	c	51	535	4
	4	320	6	υ^2 *	52	534	3
(Z^1)	5	323	6		53	539	3½
	6	321	6		54	545	3½
ρ^1	8	330	6	μ	57	551	4
ρ^2	9	335	5		58	554	5½
ρ^3	10	339	5		59	557	6
(E)*	11	336	3½		60	562	6
	12	353	3	ω	61	566	5
ζ	13	355	3	b	62	576	6
	14	356	6		63	583	6
	15	361	6		64	584	6
τ^4 †	16	363	4	ψ	65	586	5
	17	380	4½		66	599	6
ϵ	18	385	3½	β	67	603	3
(t^2) ‡	19	386	4		68	606	6
(F)	20	389	5½	λ	69	607	4
	21	391	6	(e)	(47)	368	4
	22	397	5½	(o^2)	(68)	493	6
δ	23	406	3½		(70)	641	6
π	26	415	5	(z)	(88)	382	5
(m^1) ¶	27	421	4	(y)	(113)	394	5
m^2 ¶	28	424	5¾		(138)	407	6
	30	431	5½	(h)	(149)	411	5
	32	432	4½		(157)	542	6
(l) **	33	434	4½		(158)	285	5
γ^1	34	440	2	ι	(159)	288	4½
	35	445	5	(P)	(167)	546	6
(k) ††	36	444	4½		(183)	426	5
	37	460	6	(g)	(189)	428	5
o	38	464	4		(197)	553	6
A	39	470	5	(i)	(202)	437	5
d	40	472	5	θ^1	(238)	325	4½
(X) ¶¶	41	482	3¾		(251)	456	6
ξ	42	495	6		[633]	526	6
υ^6	43	506	5	α	102 C	182	1
(k^1)	44	513	5½	χ	127 C	210	4
(k^2)	45	521	5½	ϕ	154 C	241	4
	46	524	5	κ	168 C	256	4½
	47	527	5				

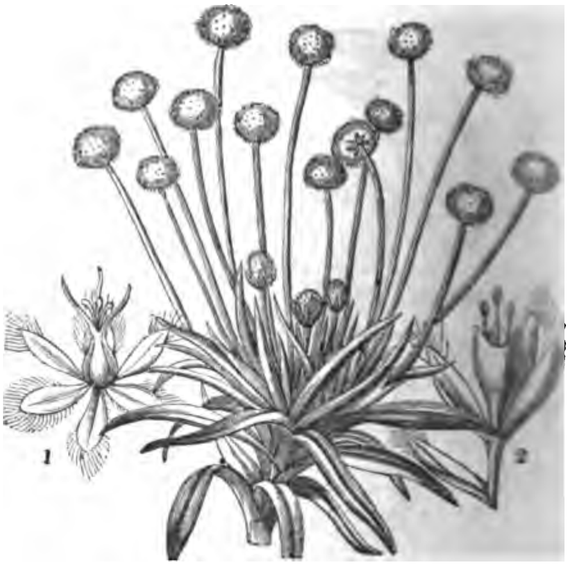
ERIE, LAKE. [Canada.]

ERI'GENA, JOANNES SCOTUS, a native of Ireland, from whence his appellation of Erigena is derived, that of Scotus being synonymous with it, as the Irish were still called in foreign countries Scots in those times, flourished about the middle of the ninth century, and was a celebrated scholar of that age. He resided chiefly in France, at the court of Charles the Bald, who seems to have been very partial to him. His writings on theological matters were considered as heterodox, and his treatise on the Eucharist was condemned to be burnt by the council of Rome A.D. 1059. [Berenger.] His treatise on predestination is found in the *Vindiciæ Prædestinationis et Gratiæ*, 2 vols., 4to., 1650. In his work 'Dialogus de Divisione Naturæ' he displays a wonderful information for the times he lived in, and an intimate acquaintance with the Greek language. He gives large extracts from the Greek fathers, and also quotes Aristotle, Plato, Cicero, Pliny, and other antient philosophers, and he gives the opinions of Pythagoras and Eratosthenes on some astronomical topics. In another part he inserts a very elaborate discussion on arithmetic, which, he says, he had learnt from his infancy. Turner, in his history of the Anglo-Saxons, has given an account of this singular work of this writer. Erigena also translated from the Greek certain theological works attributed to Dionysius Areopagita. To the writings and translations of Erigena is attributed by some the introduction of the later Platonism of the Alexandrian school into the theology and metaphysics of Europe. Erigena is believed to have died in France about the year 875. He must not be confounded with Joannes Duns Scotus, who lived in the thirteenth century. [Duns Scotus.]

ERINA'CEUS. [Hedgehog.]

ERINNA, a poetess and the friend of Sappho, flourished about the year 595 B.C. All that is known of her is contained in the following words of Eustathius (ad Iliad ii., p. 327.) 'Erinna was born in Lesbos, or in Rhodes, or in Teos, or in Telos, the little island near Cnidos. She was a poetess, and wrote a poem called 'The Distaff,' in the Æolic and Doric dialect: it consisted of 300 hexameter lines. She was the friend of Sappho, and died unmarried. It was thought that her verses rivalled those of Homer. She was only 19 years old when she died.' Another poetess of this name is mentioned by Eusebius under the year 354 B.C. This appears to be the same person who is mentioned by Pliny (*Hist. Nat.* xxxiv. 8) as having celebrated Myr[illegible] in her poems. We possess no fragments of either of these poetesses.

ERIOCAULO'NEÆ, a group of endogenous plants subordinate to Restiaceæ, for the most part inhabiting swamps or marshy places, or the bottom of lakes, and having the flowers collected into dense heads. The sexes are separated; the perianth consists of from two to six divisions immersed in soft bracts; there are from two to six stamens; the styles are two or three; the cells of the ovary are the same number, and the seeds solitary, with lines of hairs upon their surface. The embryo is placed on the outside of the albumen at the apex of the seed. The flowers are always very small, and difficult to examine on account of the thinness and delicacy of their texture. Eriocaulon itself is the *principal* genus, consisting of about one hundred and twenty known species, ninety-four or ninety-five of which are met with in the equinoctial parts of America, and one solitary instance, E. septangulare, in the Isle of Skye. Mr. Bongard, who has written a monograph of the South American species, states, that in that part of the world, although they prefer marshy and inundated places, yet some are found upon damp sand, others among grass, and some in dry and stony places; they



Eriocaulon dendroideum.

1. A female flower with six segments to its perianth, the three outermost of which are broadest and fringed with long hairs. The ovary has three stigmas, exterior to which are three horn-like appendages. 2. A male flower; a [illegible] at the base, the three outer divisions of the perianth separate, the three inner united into a three-toothed cup, and three stamens within its border.

---

* Mr. Baily marks this τ^3.

† So marked by Mr. Baily.

‡ Mr. Baily marks this τ^5.

¶ Mr. Baily marks these τ^6 and τ^7.

** τ^8 in Mr. Baily's work.

†† Mr. Baily marks this τ^9.

¶¶ Marked υ^4 by Mr. Baily.

* υ^7 in Mr. Baily's Catalogue.

are also frequently met with in alpine situations, some as high as 5460 feet above the sea on the summit of Mount Itambé. The preceding figure of Eriocaulon dendroideum gives a correct notion of the appearance of these plants.

ERIO'PHORUM, the systematic name of the sedge-like plant which is called in this country wild cotton, or cotton-grass, in consequence of the long cottony tufts which wave upon its stalks in marshy and sedgy heaths and wastes in all parts of this country. The appearance is owing to the hypogynous scales, which, in this glumaceous genus, represent the calyx, being extended into long numerous white hairs, which project far beyond the scales of the flower head. It is not a little curious that while, in most of the species, these hairs are indefinitely numerous, they should in one, E. alpinum, be reduced to the regular number, six, which is the general proportion of floral envelopes belonging to endogens. Professor Kunth enumerates twelve species, all inhabiting the colder parts of the northern hemisphere.

ERI'PHIA, Latreille's name for a genus of Brachyurous or short-tailed Crustaceans.

Carapace less wide, and more quadrilateral than in the other Cancerians; length two-thirds more than the breadth; the fronto-orbital border occupies more than one-half, and sometimes more than three-fourths of its breadth; and the latero-anterior borders, directed nearly right backwards, only describe a slight curvature, and prolong themselves but little. *Orbits*, as in the genus *Ruppellia*; but the space which separates their edges from the basilary joint of the external antennæ is very considerable; this joint is but little developed, and does not occupy a fourth of the space comprised between the antennary *fossettes* and the internal canthus of the eyes; on the contrary, the moveable stem of the external antennæ is much more developed than in the *Ruppelliæ*, and is inserted at a small distance from the antennary fossette. For the rest, not differing from the other Cancerians.

M. Milne Edwards, whose description we have given, says, that the *Eriphiæ*, which he places among the Quadrilateral Crustaceans, approach the *Ruppelliæ* nearly, but that the general form of the body of *Eriphia* tends to establish a passage towards the *Thelphusæ*. He divides the species into the following sections.

α.

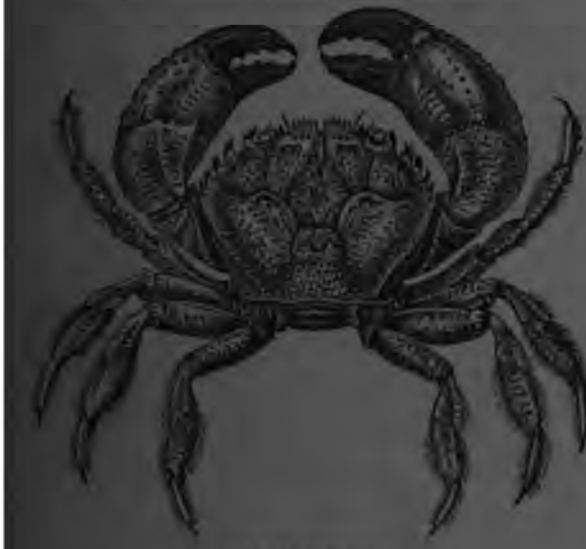
Species having the hands (manus) tuberculous.

*

Front armed with spines.

Example.—*Eriphia spinifrons* (*Cancer spinifrons*, Herbst).

Locality.—Inhabits all seas (Milne Edwards).



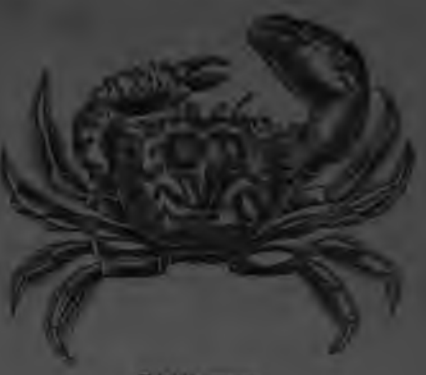
Eriphia spinifrons.

* *

Front devoid of spines.

Example.—*Eriphia gonagra* (*Cancer gonagra*, Fabricius).

Locality.—Coasts of South America.



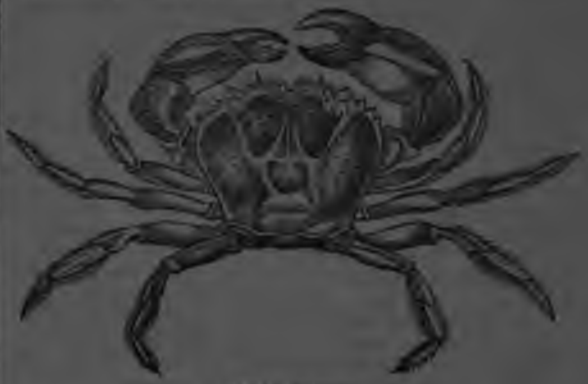
Eriphia gonagra.

β.

Species having the hands (manus) smooth, not tuberculous.

Example.—*Eriphia lævimana*.

Locality.—Isle of France.



Eriphia lævimana.

M. Milne Edwards observes, that the *Eriphia* figured by Savigny (*Egyp.*, pl. 5, fig. 1), and referred with doubt by M. Audouin to *E. spinifrons*, appears to him (Edwards) to be a distinct species; and that *Eriphia prismatica* of Risso has not been described with sufficient details to justify its reference to this genus with certainty. *Cancer eurynome* (Herbst) appears to M. Edwards to be an *Eriphia*.

ERIVAN is a town in the Russian government of Georgia, or Grusia, situated about 40° N. lat., and 44° 30′ E. long., at no great distance from the place where the boundary lines of Russia, Persia, and Turkey meet. The country in which it lies once belonged to the kingdom of Armenia, and in later times to the Persian province of Azerbijan, but was given to Russia by the peace of Turkmantshai in 1828. The town is situated on the banks of a considerable river, named Zanga, or Zengin, which flows from the lake of Erivan, or Goukcha, and falls into the river Aras; the river is crossed at the town by a handsome stone bridge of several arches. The town is built partly on a hill and fortified, besides being defended by a fort, which is of an elliptical form, upwards of 6000 yards in circuit, and surrounded by two strong walls flanked with towers. The town is of considerable extent, but probably does not contain more than 10,000 or 12,000 inhabitants, the greatest part of its area being occupied by gardens. The base of Mount Ararat is only about six or eight miles from the town.

ERLANGEN, or CHRISTIAN'S ERLANGEN, the principal town of the bailiwic of Erlangen, in the Bavarian circle of the Retzat, and the only Protestant university in the kingdom of Bavaria, is situated in a sandy but well cultivated plain, in 49° 35′ N. lat., and 11° 4′ E. long., within a short distance of the confluence of the Regnitz and Schwabach. It is divided into the Old and New Town, the latter of which was founded by Christian, Markgrave of Bayreuth, in the year 1686, and first inhabited by some French colonists: from that prince it takes the name of Christian's Erlangen. It is surrounded by walls, has seven gates, and its population is about 10,000, of whom about 600 are Roman Catholics. The New Town is handsome, and regularly built. Erlangen has three Lutheran and two Reformed Lutheran churches, a Roman Catholic place of worship, an orphan asylum, and infirmary, and a military hospital. The palace, which was partially destroyed by fire in 1814, has been fitted up for the use of the university, which was founded by Frederic, Markgrave of Bayreuth, in 1743. The establishments now connected with it are—an equestrian academy, a gymnasium, an ecclesiastical seminary, a polytechnic school, an academy of morals and the fine arts, a fine chemical laboratory, a botanical garden, a philological seminary, an anatomical school, museums of natural history, the fine arts, and experimental philosophy, a library of upwards of 100,000 volumes, and a clinical institute. The average yearly number of students attending this university is about 350. The Leopold-Caroline academy of naturalists, which was established in the year 1666 simultaneously with the Parisian academy of sciences, has its seat here, and is the first learned society that was instituted in Germany. There are also a society of medicine and natural philosophy, and a general society for domestic and rural economy. The town has factories for weaving and printing cotton goods, and also manufactures stockings and hats on a large scale, gloves, leather, tobacco, looking glasses, linen, toys, &c. Erlangen, together with the principality of Bayreuth, became an appendage of the Bavarian crown by the treaty of 1809.

ERLAU (in Hungarian EGER, and in antient records AGRIA) is the chief town of the county of Heves, in Upper Hungary. It is situated in a beautiful valley in the midst of richly cultivated lands, skirted by mountains crowned by woods and vineyards; in 47° 53′ N. lat., and 20° 23′ E. long. The Erlaubach divides it into two parts, which are surrounded by fortifications about seven miles in circuit, through which there are six gates; the number of houses is about 2900, and of inhabitants about 18,400, but the majority dwell in the suburbs outside the walls. Erlau was founded by Stephen, king of Hungary, who resided in it about 800 years ago, and made it the seat of a bishop; of late years it has become that of an archbishop. It contains four Roman Catholic churches, two monasteries, and a Greek and a Protestant church. The houses in the town are large, and built in a neat style; the principal ornament is the Lyceum, a very handsome and spacious edifice, begun by Count Charles Eszterházy in 1760, and finished in 1775, at a cost of upwards of 160,000*l.*; there is an observatory 172 feet high, a handsome chapel, and a very spacious examination hall and library attached to the institution. The Lyceum has two faculties, philosophy and jurisprudence, conducted by sixteen professors, and is very numerously attended. Opposite the Lyceum stands the cathedral church, which has nothing remarkable about it; but the neighbouring church of the Minorites is a splendid structure. The archbishop's palace is a fine building situated on a hill. Erlau has a county hall, a high school, an ecclesiastical seminary, an asylum for decayed clergymen, a school for educating teachers, several libraries, an hospital, and two mineral springs much used by invalids. The town has an extensive traffic in red wines, the produce of the vineyards in the vicinity, which is estimated at 1,197,000 gallons per annum. The manufactures consist of linens, woollens, hats, &c.

ERMINE, or ERMIN, one of the furs in heraldry, so called from the *mustela erminia*, whose skin furnishes it. It is represented white, with black spots or tufts. The black spots in ermine are not of any determinate number, but are left to the discretion of the herald-painter.

ERMINE. [MUSTELA.]

ERNE, LOUGH, lies almost entirely in the county of Fermanagh, which it traverses from one end to the other. The limits are considered to extend from Beleek on the north-west to Belturbet on the south-east, a length of forty English miles; but for some distance within these two towns, as well as about Enniskillen, it is so narrow as to form more properly part of the river Erne. It offers the greatest extent of inland navigation, though somewhat obstructed by shallows, of any of the Irish lakes; but Lough Neagh, from being more free from islands, contains a greater surface of water. The waters of Lough Erne do not possess the petrifying qualities of that lake, but they have a harsh and unpleasant taste, and are unwholesome to drink, particularly at the season for gathering the flax which is laid to soak along its shores.

The lake abounds in fish—such as trout, salmon, pike, perch, bream, eels, and smaller fish: there are also great quantities of wild duck, and during the winter it is visited by flocks of geese and various marine birds. There is not one village immediately on its shores along the whole extent, and the country is but thinly populated. There are several ruins of antient castles along the shores, and on the island of Devenish is a round tower in excellent preservation. Several large rivers empty themselves into the lake, which are navigable for boats from two to three miles up. On account of the numerous shoals and fords that occur in the narrow parts, the boats employed on the lake are chiefly flat-bottomed, and of a very rude construction: they are called 'cots,' and are principally used in supplying the town of Enniskillen with turf.

Lough Erne is usually considered as divided into two, the Upper and Lower Lakes, with a distance of six or seven miles between them, consisting of a narrow channel, which may more properly be called part of the river Erne. The Lower Lake is by far the larger and deeper, having in some places from 200 to 230 feet of water, but the depth is very irregular, and its surface is thickly studded with islands. Although within four miles of the sea, it stands at an elevation of 148 feet above low-water spring-tides in the dry season, and rises from 6 to 8 feet in the winter, according to the season. The first fall occurs at the village of Belleek, from which point to Ballyshannon there is a constant succession of falls. There is in this lake an expanse of water about ten miles in length and five in breadth, tolerably clear of islands.

In the Upper Lake the most open part is not above a mile and a half in each direction, and in this space are several small islands. Its depth seldom exceeds 20 feet, the greatest that occurs being 75. Its level ranges from 11 inches to 2 feet 10 inches above the Lower Lake, the mean difference being about 20 inches.

The general features of the shores around the lake are rounded isolated limestone hills of moderate height, rarely rising to 600 feet above its surface, except towards the western extreme, where the Poola Fooka range of table-land reaches 1000 feet. The prevailing nature of the bottom is a bluish clay.

END OF VOLUME THE NINTH.

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